



JOURNAL

OF THE

STATISTICAL SOCIETY

(Founded 1834.)

VOL. XLVI.—YEAR 1883.

LONDON:

EDWARD STANFORD, 55, CHARING CROSS, S.W.

1883.

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NOTICE.

THE Council of the Statistical Society wish it to be understood, that, while they consider it their duty to adopt every means within their power to test the facts inserted in this *Journal*, they do not hold themselves responsible for their accuracy, which must rest upon the authority of the several Contributors.

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HIS ROYAL HIGHNESS THE PRINCE OF WALES, K.G.

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(Corrected to 31st December, 1883.)

STATISTICAL SOCIETY.

(FOUNDED 1834.)

SOMERSET HOUSE TERRACE (KING'S COLLEGE ENTRANCE).

STRAND, W.C., LONDON.

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LONDON:

PRINTED FOR THE SOCIETY,

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Printers in Ordinary to Her Majesty.

1884.

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AN OUTLINE OF THE OBJECTS OF THE STATISTICAL SOCIETY.

THE *Statistical Society* of London was founded, in pursuance of a recommendation of the British Association, for the Advancement of Science, on the 15th of March, 1834; its object being, the careful collection, arrangement, discussion and publication, of facts bearing on and illustrating the complex relations of modern society in its social, economical, and political aspects.—especially facts which can be stated numerically and arranged in tables:—and also, to form a Statistical Library as rapidly as its funds would permit.

The Society from its inception has steadily progressed. It now possesses a valuable Library and a Reading Room: ordinary meetings are held monthly from November to June, which are well attended, and cultivate among its Fellows an active spirit of investigation: the papers read before the Society are, with an abstract of the discussions thereon, published in its *Journal*, which now consists of forty-six annual volumes, and forms of itself a valuable library of reference.

The Society has originated and statistically conducted many special inquiries on subjects of economic or social interest, of which the results have been published in the *Journal* or issued separately; the latest instance being the institution of the “Howard Medal” Prize Essay.

To enable the Society to extend its sphere of useful activity, and accomplish in a yet greater degree the various ends indicated, an increase in its numbers and revenue is desirable. With the desired increase in the number of Fellows, the Society will be enabled to publish standard works on Economic Science and Statistics, especially such as are out of print or scarce, and also greatly extend its collection of Foreign works. Such a well-arranged Library for reference, as would result, does not at present exist in England, and is obviously a great *desideratum*.

The Society is cosmopolitan, and consists of Fellows and Honorary Members, forming together a body, at the present time, of more than *nine hundred* Members.

The Annual Subscription to the Society is *Two Guineas*, and at present there is no entrance fee. Fellows may, on joining the Society, or afterwards, compound for all future Annual Subscriptions by a payment of *Twenty Guineas*.

The Fellows of the Society receive gratuitously a copy of each part of the *Journal* as published Quarterly, and have the privilege of purchasing back numbers at a reduced rate. The Library (reference and circulating), and the Reading Room, are open daily, for the convenience of Members.

Nomination Forms and any further information will be furnished, on application to the Assistant Secretary.

CALENDAR FOR SESSION 1883-4.

1883	MON.	TUES.	WED.	THURS.	FRI.	SATUR.	SUN.	1884	MON.	TUES.	WED.	THURS.	FRI.	SATUR.	SUN.
MAY	1	2	3	4	5	6	7	MAY	1	2	3	4	5	6	7
	8	9	10	11	12	13	14		8	9	10	11	12	13	14
	15	16	17	18	19	20	21		15	16	17	18	19	20	21
	22	23	24	25	26	27	28		22	23	24	25	26	27	28
	29	30	31						29	30	31				
JUNE	1	2	3	4	5	6	7	JUNE	1	2	3	4	5	6	7
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JULY	1	2	3	4	5	6	7	JULY	1	2	3	4	5	6	7
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AUG.	1	2	3	4	5	6	7	AUG.	1	2	3	4	5	6	7
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SEP.	1	2	3	4	5	6	7	SEP.	1	2	3	4	5	6	7
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	15	16	17	18	19	20	21		15	16	17	18	19	20	21
	22	23	24	25	26	27	28		22	23	24	25	26	27	28
	29	30	31						29	30	31				

The ordinary Meetings of the Society, at which Papers are read and discussed, are held on the Calendar dates by each Lecture.

The Close and Lecture at 7.45 p.m., precisely.

Lecture delivered on the Gold, by permission of the Committee of Council of the Theatre of the Royal School of Mines, 28, Jermyn Street, S.W.

THE ANNIVERSARY MEETING

Will be held on the 24th JUNE, 1884, at 4 P.M.

STATISTICAL SOCIETY.

MONTHLY MEETINGS—SESSION 1883-84.

HELD ON THE

THIRD TUESDAY IN THE MONTHS OF NOVEMBER—JUNE.

(*Except April.*)

Tuesday, Nov. 20.	Tuesday, March 18.
„ Dec. 18.	„ April 22.
„ Jan. 15.	„ May 20.
„ Feb. 19.	„ June 17.

At the Royal School of Mines, Jermyn Street, S.W.

The following Papers have been read (December, 1883):—

“The Progress of the Working Classes in the Past Half Century,” the PRESIDENT’S Inaugural Address, delivered on opening the Session in November. By ROBERT GIFFEN, Esq., LL.D.

“The Statistics of the Revenue of the United Kingdom from 1859-1882 in Relation to the Distribution of Taxation” (in continuation of a Paper read in 1860). By Professor LEONE LEVI, LL.D., &c. (Read in December.)

The Council have reason to expect that in the course of the Session some of the following Papers will be communicated to the Society:—

“A Comparison of the Fluctuations in the Price of Wheat, and in the Cotton and Silk Imports into Great Britain.” By Professor J. H. POYNTING, M.A.

“The Fifty Years’ Work of the Statistical Society; Its Past, Present: and Future Significance.” By Dr. F. J. MOUNT, F.R.C.S.

“Will the Recent Decline in the English Death Rate be Maintained?” (In continuation of Mr. Humphreys’ Paper of last Session.) By Dr. G. B. LONGSTAFF, M.A.

“Electoral Statistics as bearing on a Prospective Redistribution of the County Franchise.” By JOHN B. MARTIN, Esq., M.A.

“A Statistical Review of Canada and its Confederated Provinces.” By C. WALFORD, Esq.

“Statistics of the English-Speaking Populations.” By HYDE CLARKE, Esq.

Visitors may attend the Ordinary Meetings on the introduction of a Fellow.

HOWARD MEDAL, 1884.

The usual annual competition for the "Howard Medal" (1884) will take place subject to the same conditions as before. The Essays to be sent in on or before 30th June, 1884.

(The Medal is of Bronze, having on one side a portrait of John Howard, on the other a Wheat-sheaf, with suitable inscription).

The Council have again decided to grant the sum of £20 to the writer who may gain the "Howard Medal" in November, 1884.

The subject is—

"The Preservation of Health, as it is affected by personal habits, such as Cleanliness, Temperance, &c."

(The Candidates to be referred to Howard's account of his own habits, as well as to his opinions, as set forth in the text and foot-notes of his two works on "Prisons" and "Lazarettos.")

The following are the principal conditions:—

The Howard Medal shall be presented in the name of the President, Council, and Fellows of the Statistical Society, to the Author of the best Essay on some subject in "*Social Statistics*," a preference being given to those topics which Howard himself investigated, and illustrated by his labours and writings.

Each Essay to bear a motto, and be accompanied by a sealed letter, marked with the like motto, and containing the name and address of the author; such letter not to be opened, except in the case of the successful Essay.

No Essay to exceed in length 150 pages (8vo.) of the *Journal of the Statistical Society*.

The Council shall, if they see fit, cause the successful Essay, or an abridgment thereof, to be read at a Meeting of the Statistical Society; and shall have the right of publishing the Essay in their *Journal* one month before its appearance in any separate independent form; this right of publication to continue till three months after the award of the Prize.

The President shall place the Medal in the hands of the successful Candidate, at the conclusion of his Annual Address, at the ordinary Meeting in November, when he shall also re-announce the subject of the Prize Essay for the following year.

Competition for this Medal shall not be limited to the Fellows of the Statistical Society, but shall be open to any competitor, providing the Essay be written in the English language.

The Council shall not award the Prize, except to the author of an Essay, in their opinion, of a sufficient standard of merit; no Essay shall be deemed to be of sufficient merit that does not set forth the facts with which it deals, in part, at least, in the language of figures and tables; and distinct references should be made to such authorities as may be quoted or referred to.

Further particulars or explanations may be obtained from the Assistant Secretary, at the Office of the Society (King's College Entrance), Strand, London, W.C.

LIST OF THE FORMER

Patron and Presidents

OF THE

STATISTICAL SOCIETY,

From its Foundation, on 15th March, 1834.

Patron.

Period.

1840-61—HIS ROYAL HIGHNESS THE PRINCE CONSORT, K.G.

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1834-36	The Most Noble the Marquis of Lansdowne, F.R.S.
1836-38	Sir Charles Lemon, Bart., M.P., F.R.S., LL.D.
1838-40	The Right Hon. the Earl Fitzwilliam, F.R.S.
1840-42	The Right Hon. the Viscount Sandon, M.P. (afterwards Earl of Harrowby.)
1842-43	The Most Noble the Marquis of Lansdowne, K.G., F.R.S.
1843-45	The Right Hon. the Viscount Ashley, M.P. (now Earl of Shaftesbury.)
1845-47	The Right Hon. the Lord Monteagle.
1847-49	The Right Hon. the Earl Fitzwilliam, F.R.S.
1849-51	The Right Hon. the Earl of Harrowby.
1851-53	The Right Hon. the Lord Overstone.
1853-55	The Right Hon. the Earl Fitzwilliam, K.G., F.R.S.
1855-57	The Right Hon. the Earl of Harrowby, K.G., D.C.L.
1857-59	The Right Hon. the Lord Stanley, M.P. (now Earl of Derby.)
1859-61	The Right Hon. the Lord John Russell, M.P., F.R.S. (afterwards Earl Russell.)
1861-63	The Right Hon. Sir J. S. Pakington, Bart., M.P., G.C.B. (afterwards Lord Hampton.)
1863-65	Colonel W. H. Sykes, M.P., F.R.S.
1865-67	The Right Hon. the Lord Houghton, D.C.L., F.R.S.
1867-69	The Right Hon. W. E. Gladstone, M.P., D.C.L.
1869-71	W. Newmarch, Esq., F.R.S., Corr. Mem. Inst. of France.
1871-73	William Farr, Esq., M.D., C.B., D.C.L., F.R.S.
1873-75	William A. Guy, Esq., M.B., F.R.S.
1875-77	James Heywood, Esq., M.A., F.R.S., F.G.S.
1877-79	The Right Hon. George Shaw Lefevre, M.P.
1879-80	Sir Thomas Brassey, K.C.B., M.P.
1880-82	Sir James Caird, K.C.B., F.R.S.

LIST OF FELLOWS.

*Those marked thus * have compounded for their Annual Subscriptions.*

The names of Members of Council are printed in SMALL CAPITALS.

Year of Election.	
1882	Abbott, Joseph, L.D.S., R.C.S., 98, <i>Queen-street, Exeter.</i>
1878	Abdur Rahman, Moulvie Syud, F.R.C.I. (<i>Barrister-at-Law</i>), 12, <i>Taltollah-lane, Calcutta, India.</i>
1876	Abrahams, Israel, F.R.G.S., 7, <i>Bedford-place, Russell-square, W.C.</i>
1870	Absolon, Eugene, 12, <i>Wellington-square, King's-road, Chelsea, S.W.</i>
1883	Ace, Rev. Daniel, D.D., F.R.A.S., <i>Laughton Vicarage, Gainsborough.</i>
1862	Acland, Henry Wentworth, M.D., C.B., F.R.S., <i>Oxford.</i>
1869	Acland, The Rt. Hon. Sir Thomas Dyke, Bart., M.P., <i>Killerton. Exeter ; and Athenæum Club, S.W.</i>
1881	Aeton, John Adams, 103, <i>Marylebone-road, N.W.</i>
1879	Adam, Robert (<i>City Chamberlain</i>), <i>City Chambers, Edinburgh.</i>
1867	Addison, John, 6, <i>Delahay-street, Great George-street, S.W.</i>
1880	Aitchison, David, 5, <i>Pembbridge-square, W.</i>
1876	Aitchison, William John, 2, <i>Princes-street, E.C.</i>
1879	Akers-Douglas, Aretas, M.P., J.P., <i>Chilston Park, Maidstone, Kent.</i>
1841	Aldam, William, F.R.S., <i>Frickley Hall, Doncaster.</i>
1876	Aldwinckle, Thomas Williams, 2, <i>East India-avenue, Leadenhall-street, E.C.</i>
1883	Alexander, Alfred Joseph, 103, <i>Pembroke-road, Clifton, Bristol.</i>
1872	Alexander, Robert Henry, 24, <i>Lombard-street, E.C.</i>

Year of Election.	
1876	Allen, John T. R., <i>North Bailey, Durham.</i>
1875	Allen, Joseph, <i>St. Mildred's House, Poultry, E.C.</i>
1877	Allen, Joseph, <i>21, Waterhouse-street, Halifax, Yorkshire.</i>
1878	Anderson, A. F., <i>131, Mount Pleasant, Liverpool.</i>
1878	Anderson, Edward C., M.A., M.D., <i>Lydiat House, Wolsingham, Darlington.</i>
1871	Anderson, Sir James, F.R.G.S., F.G.S., <i>66, Old Broad-street, E.C.</i>
1871	Angus, R. B., <i>Montreal, Canada.</i>
1872	*Archibald, William Frederick A., M.A., <i>3, Amersham-road, Putney, S.W.</i>
1883	Aschenheim, G., <i>27, Mincing-lane, E.C.</i>
1883	Askey, Frederick Day, <i>The Park, Highgate, N.</i>
1871	Atkinson, George W., <i>1, Regent-street, Burnley.</i>
1882	Atterbury, Frederick <i>Inland Revenue, Somerset House, W.C.</i>
1870	Avery, Thomas, <i>Church-road, Edgbaston, Birmingham.</i>
1872	*Babbage, Major-General Henry P. <i>Dainton House, Bromley, Kent.</i>
1872	*Backhouse, Edmund, <i>Middleton Lodge, Richmond, York.; Reform Club, S.W.</i>
1875	Baddeley, Samuel, <i>Freeland's-road, Bromley, Kent.</i>
1879	BADEN-POWELL, GEORGE S., M.A., F.R.A.S., <i>8, St. George's-place, Hyde Park Corner, S.W.</i>
1855	BAILEY, ARTHUR HUTCHESON, F.I.A. (Vice-President), <i>7, Royal Exchange, E.C.</i>
1858	Baines, Sir Edward, <i>St. Ann's-hill, Burley, Leeds.</i>
1881	Baines, Jervoise Athelstane, C.S., <i>Secretariat, Poona, Bombay Presidency, India</i>
1882	Baker, Daniel <i>104, Colmore-row, Birmingham.</i>
1879	Baker, W. Mills, <i>The Holmes, Stoke Bishop, near Bristol.</i>

- Year of
Election.
- 1878 Balfour, Arthur James, M.P.,
4, *Carlton-gardens, S.W.*
- 1848 Balfour, General Sir George, K.C.B., M.P., D.L.,
6, *Cleveland-gardens, Bayswater, W.*
- 1873 Balfour, Jabez Spencer, M.P.,
20, *Budge-row, Cannon-street, E.C.*
- 1865 BALFOUR, T. GRAHAM, M.D., F.R.S.,
Coombe Lodge, Wimbledon-park, S.W.
- 1879 Bamber, Edward Fisher, C.E.,
67, *Shaftesbury-road, Ravenscourt-park, W.*
- 1877 Barbour, William B.,
196, *Haverstock-hill, N.W.*
- 1873 Barham, Francis F.,
Bank of England, Birmingham.
- 1880 *Baring, Thomas Charles, M.P.,
High Beach, Loughlyn.
- 1881 *Barrington-Kennett, V. B., M.A., LL.M., Cantab.,
15, *Hyde Park-gardens, W.*
- 1883 Barron, Thomas Walter, M.A., M.B., M.R.C.S., &c.,
10, *Old Elvet, Durham.*
- 1878 Barry, Francis Tress,
St. Leonard's-hill, Windsor.
- 1879 Barry, Frederick W., M.D.,
Local Government Board, Whitehall, S.W.
- 1881 Bartlett, Robert Vincent Osborne,
16, *West End-terrace, Newport, Isle of Wight.*
- 1872 *Bass, Sir Michael Arthur, Bart., M.P.,
101, *Eaton-square, S.W.*; *Rangemore, Burton-on-Trent.*
- 1836 Bass, Michael Thomas, M.P.,
101, *Eaton-square, S.W.*; *Rangemore, Burton-on-Trent.*
- 1873 Bate, George,
10, *City-road, E.C.*
- 1877 BATEMAN, ALFRED EDMUND (*Secretary*),
Board of Trade, 1, Whitehall, S.W.
- 1876 Baxter, Robert,
6, *Victoria-street, Westminster, S.W.*
- 1877 Bayfield, Arthur,
32, *Temple-row, Birmingham.*
- 1873 *Baynes, Alfred Henry, F.R.G.S.,
19, *Castle-street, Holborn, E.C.*
- 1871 *Baynes, William Wilberforce, F.L.A.,
32, *Moorgate-street, E.C.*
- 1877 Beadel, William J.,
Springfield Lyons, Chelmsford.
- 1875 *Beardsol, Francis E. M.,
64, *Cross-street, Manchester.*
- 1878 *Beauchamp, The Right Hon. Earl,
13, *Belgrave-square, S.W.*
- 1875 Beaufort, William Morris, F.R.A.S., F.R.G.S., &c.,
18, *Piccadilly, W.*

Year of Election.	
1883	Beaumont, Henry <i>Gordon Villa, The Park, Highgate, N.</i>
1882	*Beazeley, Michael Wornum, <i>3, Church-villas, St. Paul's-road, Thornton Heath, Surrey.</i>
1883	Beckingham, James Horace, <i>48, Percy Park, Tynemouth. Northumberland.</i>
1880	Beddell, Charles, <i>Hotham House, Merton Abbey, Surrey.</i>
1863	Beddoe, John, B.A., M.D., F.R.S., <i>2, Lansdowne-place, Clifton.</i>
1872	*Bedford, His Grace, the Duke of, <i>Woburn Abbey, Oakley, Bedford.</i>
1882	*Beeton, Henry Ramie, <i>42, Belsize-square, South Hampstead, N. W.</i>
1879	Beggs, Thomas, <i>55, Russell-square, W.C.</i>
1880	Bell, Isaac Lowthian, J.P., <i>Rounton Grange, Northallerton, York, N.R.</i>
1878	Bellew, The Right Hon. Lord, <i>Barneath, Dunleer, Ireland</i>
1883	Bennoch, Francis, F.S.A., <i>5, Tavistock-square, W.C.</i>
1856	*Peresford-Hope, The Right Hon. A. J., M.P., D.C.L., <i>1, Connaught-place, W.</i>
1881	Besso, Marco, <i>Compagnia di Assicurazioni Generali, Trieste.</i>
1879	Bevan, G. Phillips, D.L., F.G.S., <i>Uplands, Richmond, Surrey.</i>
1875	Bevan, Thomas, <i>Stone Park, near Dartford, Kent.</i>
1869	*Beverley, Henry, <i>United University Club, Calcutta.</i>
1879	*Bickford-Smith, W., J.P., D.L., &c., <i>Trevanno, Helston, Cornwall.</i>
1883	Binney, W., <i>13, St. Helen's-place, E.C.,; Lillfield, Hampstead, N. W.</i>
1883	Birchenough, Henry, <i>145, Cheapside, E.C.</i>
1881	Bishop, George, <i>131, Powis-street, Woolwich.</i>
1877	Bishop, George Houlton, M.R.C.S., <i>Lock Hospital, Harrow-road, W.</i>
1883	Blades, R. H., <i>23, Abchurch-lane, E.C.</i>
1883	Blades, William, <i>23, Abchurch-lane, E.C.</i>
1877	Boddy, Evan Marlett, L.R.C.P., F.R.C.S., <i>109, Ashted-row, Birmingham.</i>

Year of
Election

- 1873 Bogie, James,
5, *March Hall-road, Newington, Edinburgh.*
- 1877 Bolam, Harry George,
Erie Post-office, New York. U.S.A.
- 1881 Bolitho, Thomas Robins.
Pendren, near Penzance.
- 1880 Bolton, Joseph C., M.P.,
Carbrook, Larkhall, Stirlingshire.
- 1879 Borchardt, Louis, M.D.,
Swinton House, Fallowfield, Manchester.
- 1879 Birdman, Thomas Joseph Clarence Linden, LL.D.,
Victoria House, Trinity-street, Southwark, E.C.
- 1875 Borthwick, The Right Hon. Lord,
Ravenstone, Whithorn, Wigtownshire, N.B.
- 1881 Bourdillon, James Austin,
10, *Calverley Park-gardens, Tunbridge Wells.*
- 1881 Bourinot, John George,
Ottawa, Canada.
- 1871 BOURNE, STEPHEN,
H.M. Custom House, E.C.; Abberley, Wallington, Surrey.
- 1877 Boucher, Emanuel,
12, *Oxford-square, Hyde Park, W.*
- 1883 Bovey, John,
Bute Docks, Cardiff, and Glenholm, Penarth, Cardiff.
- 1876 Bowen, Horace George,
Bank of England, E.C.
- 1879 Bowley, Edwin,
Burnt Ash-hill, Lee, Kent.
- 1880 Bowser, Wilfred Arthur,
33, *New Bridge-street, E.C.*
- 1874 Brabrook, Edward William, F.S.A., M.R.S.L.,
- 1883 Braby, Frederick, F.C.S., F.G.S.,
Bushy Lodge, Teddington.
- 1875 Braby, James, J.P.,
Maybanks, Rudgwick, Sussex.
- 1874 Bramley-Moore, John, D.L.,
Gerrard's-cross, Bucks.
- 1855 Brand, The Rt. Hon. Sir Henry Bouverie Wm., M.P., G.C.B.,
Speaker's Court, House of Commons, S.W.
- 1873 BRASSEY, SIR THOMAS, K.C.B., M.A., M.P.,
(Honorary Vice-President),
4, *Great George-street, S.W.*; and 24, *Park-lane, W.*
- 1844 Braye, The Right Hon. the Lord,
40, *Grosvenor-street, W.*; *Stanford Hall, Rugby.*
- 1883 Briesemann, Francis,
60, *Old Broad-street, E.C.*
- 1883 Brindle, Thomas,
North Bank, Tunbridge Wells.

- Year of Election.
- 1883 Broad, Harrington Evans,
Warlingham, Surrey, and 35. Walbrook, E.C.
- 1876 Brodhurst, Bernard Edward, F.R.C.S.,
20, Grosvenor-street, Grosvenor-square, W.
- 1883 Brooke, C. B.,
16, Leadenhall-street, E.C.
- 1874 Broom, Andrew, A.C.A.,
The Ferns, Bushey Hill-road, Camberwell, S.E.
- 1878 Brown, Alexander Hargreaves, M.P.,
12, Grosvenor-gardens, S.W.
- 1872 Brown, James Bryce, F.R.G.S.,
90, Cannon-street, E.C.; and Bromley, Kent.
- 1875 Browne, Thomas Gillespie C., F.I.A.,
11, Lombard-street, E.C.
- 1883 Buck, E. C.,
Revenue and Agricultural Department, Simla, India.
- 1865 Bunce, John Thackray,
Longworth, Priory-road, Edgbaston, Birmingham.
- 1880 Burdett, Henry Charles,
39. Gloucester-road, Regent's-park, N.W.
- 1873 *Burdett-Coutts, The Right Hon. the Baroness,
1, Stratton-street, W.; and Holly Lodge, Highgate, N.
- 1882 Burgess, John,
Prospect House, Hailsham.
- 1872 Burns, The Rev. Dawson, M.A., D.D.,
52, Parliament-street, S.W.
- 1880 Burt, Frederick, F.R.G.S.,
Woodstock, Crouch End, N.
- 1883 Bush, W. J.,
20, Artillery-lane, Bishopsgate-street, E.C.
- 1882 Butchart, Robert G.,
6, Petersham-terrace, S.W.
- 1870 Caine, William S., M.P.,
1, The Terrace, Clapham Common, S.W.
- 1857 CAIRD, SIR JAMES, K.C.B., F.R.S.,
*(Honorary Vice-President and Trustee),
8, Queen's-gate-gardens, S.W.; & Cassenary, Creetown, N.B.*
- 1880 Caird, Robert Henryson,
6, Petersham-terrace, S.W.
- 1879 Campbell, Lord Colin, M.P.,
79, Cadogan-place, S.W.
- 1874 Campbell, Sir George, K.C.S.I., M.P., D.C.L.,
17, Southwell-gardens, South Kensington, S.W.
- 1877 Campbell, George Lamb,
Market-street, Wigan.

Year of
Election.

- 1879 Campbell-Colquhoun, Rev. John Erskine,
Chartwell, Westerham, Kent.
- 1881 Carden, Lionel Edward Gresley, (*H.M. Consul*),
Havana, Cuba, W.I.
- 1872 *Carillon, J. Wilson, F.S.A., F.R.G.S.,
11, *Aynhoe-road, Hammersmith, W.*
- 1871 Carnac, H. Rivett,
Calcutta, Bengal, India.
- 1876 Carphin, James Rhind, C.A.,
14, *Hanover-street, Edinburgh.*
- 1877 Carter, E. Harold,
33, *Waterloo-street, Birmingham.*
- 1848 Carter, John Bonham,
Adhurst St. Mary, Petersfield.
- 1883 Carter, Joseph Robert,
Bessel's Green, Sevenoaks; and Stock Exchange, E.C.
- 1878 *Casley, Reginald Kennedy, M.D.,
Northgate-street, Ipswich.
- 1880 Castle, Robert,
18, *Merton-street, Oxford.*
- 1883 Cater, J. J.,
39, *Lombard-street, E.C.*
- 1883 Cattarns, Richard,
Enfield House, Grove Park, Lee, S.E.
- 1881 Causton, Richard Knight, M.P.,
3, *Clanricarde-gardens, W.*
- 1858 Chadwick, David,
The Poplars, Herne Hill, Dulwich, S.E.
- 1834 Chadwick, Edwin, C.B.,
Park Cottage, East Sheen, Mortlake, S.W.
- 1869 CHADWICK, JOHN OLDFIELD, F.R.G.S.,
24, *Budge-row, Walbrook, E.C.*
- 1880 *Chamberlain, The Right Honourable Joseph, M.P.,
40, *Prince's-gardens, S.W.*
- 1873 Charlesworth, Frederic,
Widmore, Bromley, Kent.
- 1851 *Cheshire, Edward,
3, *Tanbrugh Park, Blackheath, S.E.*
- 1883 Childs, Walter,
24, *Budge-row, Cannon-street, E.C.*
- 1853 Chisholm, David, F.I.A.,
61, *Princes-street, Edinburgh.*
- 1869 CHUBB, HAMMOND, B.A., (*Secretary*),
Bickley, Kent.
- 1877 Clapham, Crochley, L.R.C.P.,
Muriel House, Peak Hill, Sydenham, S.E.
- 1849 Clark, Gordon Wyatt,
Mickleham Hall, near Dorking, Surrey.
- 1856 Clark, Sir John Forbes, Bart.,
Tillypronie, Tarland, Aberdeen.

Year of Election	
1882	Clarke, Arthur Edward, <i>Wisbech.</i>
1871	Clarke, Ebenezer, jun., 52, <i>Cannon-street, E.C.</i>
1882	*Clarke, Ernest, <i>Share and Loan Department, Stock Exchange, E.C.</i>
1880	Clarke, Frederick Nevill, <i>Oakwood, Fountain-road, Upper Norwood, S.E.</i>
1877	*Clarke, Henry, L.R.C.P., <i>H.M. Prison, Wakefield, Yorks.</i>
1876	Clarke, Henry Harcourt Hyde, 32, <i>St. George's-square, S.W.</i>
1856	*CLARKE, HYDE, 32, <i>St. George's-square, S.W.</i>
1869	Cleghorn, John, 3, <i>Spring-gardens, S.W.</i>
1850	*Cleveland, His Grace the Duke of, K.G., <i>Batle Abbey, Sussex.</i>
1853	Clirehugh, William Palin, F.I.A., 66, <i>Cornhill, E.C.</i>
1877	Cobb, B. Francis, 79, <i>Cornhill, E.C.</i>
1873	Cockle, Captain George, F.R.G.S., 9, <i>Bolton-gardens, South Kensington, S.W.</i>
1877	COHEN, LIONEL LOUIS, (Vice-President), 9, <i>Hyde Park Terrace, W.</i>
1838	Colebrooke, Sir Thomas Edward, Bart., M.P., 14, <i>South-street, Park-lane, W.</i>
1859	Coles, John, F.I.A., 39, <i>Throgmorton-street, E.C.</i>
1874	Collins, Eugene, M.P., 38, <i>Porchester-terrace, Hyde Park, W.</i>
1877	Collins, J. Wright, J.P. (Colonial Treasurer), <i>Stanley, Falkland Islands.</i>
1874	Collinson, John, F.R.G.S., 90, <i>Cromwell-road, S.W.</i>
1883	Collmann, John S., 12, <i>Tokenhouse-yard, E.C.</i>
1882	*Collum, Rev. Hugh R., M.R.I.A., F.R.C.I., <i>Vicar of Leigh, near Tonbridge, Kent.</i>
1867	Colman, Jeremiah James, M.P., <i>Carrow House, Norwich.</i>
1878	Colomb, Captain J.C.R., R.M.A., J.P., <i>Droumquinna, Kenmare, Kerry.</i>
1879	Cooke, H. Ribton,
1879	Cooke, Isaac B., 8, <i>Wellington-road, Oxton, Birkenhead.</i>
1874	*Cookson, Faithful, F.R.G.S., 12, <i>Grafton-square, Clapham, S.W.</i>

- Year of
Election.
- 1879 Cooper, William John,
7, *Westminster-chambers, Victoria-street, S.W.*
- 1843 *Copperthwaite, William Charles,
New Malton, Yorkshire.
- 1874 Corbett, John, M.P.,
20, *Hertford-street, Mayfair, W.*
- 1833 Corgialegho, M.,
71, *Cornhill, E.C.*
- 1873 Cork, Nathaniel, F.R.G.S.,
39, *Lombard-street, E.C.*
- 1878 Cornish, William Robert, F.R.C.S. (*Surgeon Major*),
Sanitary Commissioner, Madras.
- 1883 Cosens, Frederick William,
16, *Waterloo-lane, Tower-street, E.C.*
- 1862 Courtney, Leonard Henry, M.A., M.P.,
15, *Cheyne Walk, Chelsea, S.W.*
- 1882 Cowen, Charles,
37, *Main-street, Port Elizabeth, Cape of Good Hope.*
- 1873 Cowper, The Hon. Henry Frederick, M.P.,
4, *St. James's-square, S.W.*
- 1880 Cox, William John,
- 1880 Craig, William Young, M.P.,
Palace Chambers, St. Stephen's, Westminster, S.W.
- 1874 CRAIGIE, MAJOR PATRICK GEORGE,
6, *Lyndhurst-road, Hampstead, N.W.*
- 1870 Craik, George Lillie,
29, *Bedford-street, Strand, W.C.*
- 1883 Cranwell, W. B.,
42, *Portsmouth-road, W. ; and 4, Finsbury-street, E.C.*
- 1872 Crellin, Philip,
33, *Chancery-lane, W.C.*
- 1883 Crew, J. Lewis,
113, *Arch-street, Philadelphia, Pennsylvania, U.S.A.*
- 1878 Crewdson, Ernest,
5, *Norfolk-street, Manchester.*
- 1879 Crisford, George S., F.I.A.,
West of England Insurance Company, Exeter.
- 1880 *Crompton-Roberts, Charles H.,
16, *Belgrave-square, S.W.*
- 1876 Crosse, John Burton St. Croix, F.R.C.S.,
Royal Military Asylum, Chelsea, S.W.
- 1878 Crossman, James H., J.P.,
Union Club, Trafalgar-square, S.W.
- 1883 Cullen, Thomas,
7, *Vigo-street, Regent-street, W.*
- 1875 Cunningham, David, C.E.,
Works' Office, Harbour-chambers, Dundee.
- 1883 Cunningham, Rev. William, M.A.,
2, *St. Paul's-road, Cambridge.*

Year of Election.	
1879	Curtis, Robert Leabon, F.S.I., 120, <i>London Wall, E.C.</i>
1873	Czarnikow, Cæsar, <i>Mitcham, Surrey.</i>
1869	Dalyell, The Hon. Robert Anstruther, C.S.I., <i>India Office, Westminster, S.W.</i>
1880	Danvers, Frederick Charles, <i>India Office, Westminster, S.W.</i>
1873	Danvers, Juland, <i>India Office, Westminster, S.W.</i>
1869	Davies, James Mair, <i>Chambers, 69, West Regent-street, Glasgow.</i>
1874	Davies, William Henry, <i>51, Tregunter-road, S.W.</i>
1873	Dawson, James Thomas, <i>79, Cornhill, E.C.</i>
1876	Day, William Ansell, <i>Lyndhurst House, Hendon, N.W.</i>
1880	Debenham, Frank, <i>26, Upper Hamilton-terrace, St. John's Wood, N.W.</i>
1879	*De Ferrieres, The Baron Du Bois, M.P., J.P., <i>Bay's-hill House, Cheltenham.</i>
1883	De Keyser, Alderman P., <i>Chatham House, Grove-road, Clapham Park, S.W.</i>
1877	Deloitte, William Welch, <i>4, Lothbury, E.C.</i>
1873	Dent, Clinton Thomas. F.R.C.S. <i>19, Savile-row, W.</i>
1873	Dent, Edward, <i>Fernacres, Fulmer, near Slough, Bucks.</i>
1855	*DERBY, THE RIGHT HON. THE EARL OF, F.R.S., D.C.L., (<i>Honorary Vice-President</i>), <i>St. James's-square, S.W.; Knowsley, Prescot, Lancashire.</i>
1877	Dever, Henry, <i>4, Lothbury, E.C.</i>
1877	De Worms, Baron Henry, M.P., F.R.A.S., <i>H 2, Albany, Piccadilly, W.</i>
1866	*Dilke, Sir Charles Wentworth, Bart., M.P., LL.M., <i>76, Sloane-street, S.W.</i>
1881	Dillon, Malcolm, <i>Stradbroke Lodge, Putney, S.W.</i>
1873	Dixon, George, <i>The Dales, Edgbaston, Birmingham.</i>
1881	Dobell, R. R., <i>Quebec, Canada.</i>
1875	Doxsey, Rev. Isaac, <i>The Grove, Camberwell, S.E.</i>

Year of Election.	
1878	Doyle, Patriek, C. E., <i>Local Fund, Public Works Department, Bellary, Madras.</i>
1872	Droop, Henry Richmond, <i>1a, New-square, Lincoln's-inn, W.C.</i>
1878	Duignan, William Henry, <i>W'alsall, Staffordshire.</i>
1875	Dun, John, <i>Parr's Banking Company, Limited, Warrington.</i>
1870	Duncan, James, <i>9, Mincing-lane, E.C.</i>
1878	*Dunraven, The Right Hon. Earl of, K.P., <i>Kenry House, Putney Vale, S.W.</i>
1883	Edgeworth, Francis Ysidro, M.A., <i>Surile Club, 107, Piccadilly, W.</i>
1836	Edmonds, Thomas Rowe, B.A., <i>72, Portsdown-road, Maida-vale, W.</i>
1869	Edmonds, William, <i>Annesley House, Southsea.</i>
1880	Egerton, The Right Honourable The Lord <i>23, Rutland Gate, S.W.</i>
1883	Eley, Charles, <i>201, Mansion House Chambers, Queen Victoria-st., E.C.</i>
1872	Elliot, Sir George, Bart., M.P., <i>Park-street, Park-lane, W.</i>
1882	Elliott, Henry Thomas Worton, <i>Inland Revenue Office, Somerset House, W.C.</i>
1877	Ellis, Arthur, <i>42, High-street, Highgate, N.</i>
1883	Ellis, Alderman Sir John Whitaker, Bart., <i>21, Hertford-street, Mayfair, W.</i>
1873	Elsey, John Green, J.P., <i>Morant House, Addison-road Kensington, W.</i>
1873	Emanuel, Lewis, <i>36, Finsbury-circus, E.C.</i>
1877	Emmott, W. T., <i>Blackfriars street, Manchester.</i>
1882	Essex, Benjamin Smily, <i>446, Strand, W.C.</i>
1879	Evans, Henry Jones, J.P., <i>Brecon Old Bank, Cardiff.</i>
1880	Evan, Henry Russell, <i>Newport, Monmouth.</i>
1875	Everett, The Hon. H. Sidney, M.A., <i>United States Legation, 4, Alsenstrasse, Berlin.</i>
1834	Eversley, The Right Hon. Viscount, D.C.L., LL.D., <i>114, Eaton-square, S.W.; and Winchfield, Hants.</i>

Year of Election	
1875	Faraday, Frederick J., 17, <i>Brazenose-street, Manchester.</i>
1874	Farmer, James, 6, <i>Porchester-gate, Hyde Park, W.</i>
1868	Farrell, John Douglas, <i>Bank of England, West Branch, Burlington-gardens, W.</i>
1878	Farren, George, M.I.C.E., <i>Carnarvon.</i>
1878	FARRER, SIR THOMAS HENRY, BART., <i>Board of Trade, Whitehall Gardens, S.W.</i>
1876	Fearnside, Henry, M.B., F.R.C.P., <i>c/o Rev. F. F. Goe, 1, Montague-place, Russell-square, W.C.</i>
1882	Fell, Arthur, M.A., 46, <i>Queen Victoria-street, E.C.</i>
1864	Fellows, Frank P., 8, <i>The Green, Hampstead, N.W.</i>
1874	Ferguson, A.M., "Ceylon Observer" Office, <i>Colombo, Ceylon.</i>
1880	Finch, George Henry, M.P., <i>Burley-on-the-hill, Oakham.</i>
1880	Finlaison, Alexander John, F.I.A., 19, <i>Old Jewry, E.C.</i>
1880	Finlay, George, <i>London and N. Western Railway, Euston Station, N.W.</i>
1882	Foley, P. J., <i>Pearl Ins. Co., Adelaide-place, London Bridge, E.C.</i>
1878	Follett, Charles John, M.A., B.C.L., <i>H.M. Custom House, E.C.</i>
1875	Fordham, Edward King, J.P., D.L. <i>The Bury, Ashwell, Baldock, Herts.</i>
1841	Fortescue, The Right Honourable Earl, <i>Castle Hill, South Molton, Devon.</i>
1877	*Fowler, Alderman Robert Nicholas, M.P. (The Right Hon. The Lord Mayor), <i>The Mansion House; and Elm Grove, Corsham, Wilts.</i>
1868	Fowler, William, M.P., 38, <i>Grosvenor-square, S.W.</i>
1878	FOXWELL, PROFESSOR HERBERT SOMERTON, M.A., <i>St John's College, Cambridge.</i>
1879	Francis, George Edward, <i>Staunton Coleford, Gloucestershire.</i>
1882	Fraser, D. Manson, M.A., M.D., <i>c/o of D. Fraser, Esq., Invergordon, Ross, N.B.</i>
1883	Fraser, George J., 34, <i>Ladenhall-street, E.C.</i>
1844	*Freeland, Humphrey William, J.P., <i>Athenæum Club, S.W.; and Chichester.</i>
1876	Freeman, Joseph, <i>Lawn Villa, 74, Acre-lane, Brixton, S.W.</i>

Year of
Election.

- 1876 Freeman, T. Kyffin,
c/o R. Scarlett, Esq., 9, King Edward-street, E.C.
- 1878 Fuller, W. Palmer,
50, Gresham-street, E.C.
- 1879 Fung, Yee,
49, Portland-place, W.
- 1879 Gairdner, Charles,
Broom, Newton Mearns, Renfrewshire.
- 1881 Gale, James Thomas,
10, Kersley-street, Battersea-park, S.W.
- 1852 Galsworthy, Edwin Henry, J.P., F.I.A.,
18, Park-crescent, Portland-place, W.
- 1873 *Galton, Capt. Douglas, R.E., C.B., F.R.S.,
12, Chester-street, Grosvenor-place, S.W.
- 1860 Galton, Francis, F.R.S., F.R.G.S.,
42, Rutland-gate, S.W.
- 1878 Gardiner, Henry J.,
Hurstmead, Eltham, Kent.
- 1881 Garnett, Frederick Brooksbank,
Board of Inland Revenue, Somerset House, W.C.
- 1881 Garraway, The Hon. David G., (*Acting Treasurer*),
Castries, St. Lucia, West Indies.
- 1879 *Gassiot, John Peter, J.P.,
The Culvers, Carshalton, Surrey,
- 1872 Gastrell, Major-General J. E.,
Lansdowne-road, Bedford.
- 1883 Gates, Jacob S.,
9, Fenchurch-avenue, E.C.
- 1880 *Gates, John B., jun., A.C.A.,
99, Gresham-street, E.C.
- 1881 *Gatty, William Henry,
Market Harborough, Leicestershire.
- 1872 Gibb, Thomas Eccleston,
16, Lady Margaret-road, N.W.
- 1874 Gibbs, Alban George Henry,
82, Portland-place, W.
- 1871 Gibbs, George Sleight,
Derry Lodge, Darlington.
- 1882 Gibbs, Richard,
14, Holland-park, W.
- 1867 *GIFFEN, ROBERT, LL.D. (*President*),
44, Pembroke-road, Kensington, W.
- 1877 Gilbert, William H. Sainsbury,
9, Old Jewry, E.C.

Year of Election.	
1878	*Glanville, S. Goring, 238, <i>Lewisham High-road, S.E.</i>
1860	GLOVER, JOHN, 88, <i>Bishopsgate-street Within, E.C.</i>
1877	Goddard, Frederick Robertson, 19, <i>Victoria-square, Newcastle-on-Tyne.</i>
1877	Good, Alfred, (7, <i>Poultry, E.C.</i>), <i>Downe Lodge, by Beckenham, Kent.</i>
1880	Goodhart, Charles E., <i>Langley-park, Beckenham, Kent.</i>
1881	Goodrich, S. G., 81, <i>Cheapside, E.C.</i>
1868	Göschén, The Right Hon. George Joachim, M.P., 69, <i>Portland-place, W.</i>
1855	*Gosset, John Jackson, <i>Thames Ditton, Surrey.</i>
1853	Gover, William Sutton, F.I.A., 4, <i>Queen-street-place, Southwark Bridge, E.C.</i>
1876	Grahame, James, C.A., 12, <i>St. Vincent-place, Glasgow.</i>
1879	Grant, Daniel, M.P., 12, <i>Cleveland-gardens, Bayswater, W.</i>
1875	Granville, Joseph Mortimer, M.D., F.G.S., &c., 18, <i>Welbeck-street, Cavendish-square, W.</i>
1847	Gray, Thomas, 34, <i>Fenchurch-street, E.C.</i>
1877	Greene, William Thomas, M.A., M.D., <i>Moirs House, Peckham Rye, S.E.</i>
1881	Greening, William H., <i>Oakfield Cottage, Balsall Heath, Birmingham</i>
1883	Griffin, Josiah, <i>Vanburgh Park, Blackheath, S.E.</i>
1868	Griffith, Edward Clifton, 1, <i>Waterloo-place, S.W.</i>
1882	Griffiths, Ebenezer, 166, <i>St. John's-road, Hornsey Rise.</i>
1883	Grimshaw, Thomas Wrigley, M.D., M.A., &c. (Registrar-General of Ireland), <i>Priorsland, Carrickmines, Co. Dublin.</i>
1883	Gunther, Charles, 9, <i>Fenchurch-avenue, E.C.</i>
1875	Gunn, Arthur, 31, <i>Gloucester-road, Gloucester-gate, Regent's Park, N.W.</i>
1878	Guthrie, Charles, <i>London Chartered Bank of Australia, Melbourne, Victoria.</i>
1839	GUY, WILLIAM AUGUSTUS, M.B., F.R.C.P., F.R.S., (Honorary Vice-President), 12, <i>Gordon-street, Gordon-square, W.C.</i>

Year of
Election

- 1880 *Gwynne, J. Eglinton A., J.P., F.S.A.,
97, *Harley-st., W.*; *Folkington Manor, Polegate, Sussex.*
- 1883 Hadrill, Henry John,
60, *Mark-lane, E.C.*
- 1873 *Haggard, Frederick T.,
The Grove, East Burnham, near Slough.
- 1876 Hall, Edward Hepple, F.R.A.S., &c.,
- 1869 Hall, James Macalester,
Killean House, Tayinloan, Argyleshire.
- 1883 Hall, Sir John, K.C.M.G.,
Government Office, Wellington, New Zealand.
- 1878 Hallett, T.G.P., M.A.,
Claverton Lodge, Bath.
- 1873 Hamilton, The Right Hon. Lord George Francis, M.P.,
17, *Montagu-street, Portman-square, W.*
- 1883 Hamilton, James Thomas,
23, *High-street, Southampton.*
- 1882 Hamilton, John,
Junior Carlton Club, Pall Mall, S.W.
- 1882 Hamilton, John James,
The Grange, Chislehurst.
- 1879 HAMILTON, ROWLAND.
Oriental Club, Hanover-square, W.
- 1873 Hanbury, Robert William,
Ilam Hall, Ashbourne, Derbyshire.
- 1869 Hancock, William,
35, *Cornhill, E.C.*
- 1879 Hancock, William Neilson, LL D., Q.C., M.R.I.A., (*President of the Statistical and Social Inquiry Society of Ireland*),
43, *Upper Gardiner-street, Dublin.*
- 1875 Hankey, Ernest Alers,
Elmhurst, Bickley-park, Kent.
- 1879 Hankey, Thomson,
59, *Portland-place, W.*
- 1861 Hannington, Major-General John Caulfield, F.I.A.,
India Office, Westminster, S.W.
- 1876 Hansard, Luke,
68, *Lombard-street, E.C.*
- 1883 Hansell, Robert B.,
Moor Oaks-road, Broomhill, Sheffield.
- 1871 Harcourt, Right Hon. Sir William Vernon, Q.C., M.P., F.R.S.,
7, *Grafton-street, Bond-street, W.*
- 1877 Harding, Charles, M.R.S.L., F.R.G.S.,
7, *Bank Buildings, E.C.*

- | Year of
Election. | |
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| 1883 | Harding G. P.,
<i>La Chaumiere, Trouville, France; and 1, Austin Friars, E.C.</i> |
| 1883 | Hardy, William H., F.C.A.,
<i>5, Great Winchester-street, E.C.</i> |
| 1877 | Harold, Frederick Richard, |
| 1868 | Harris, David,
<i>Caroline Park, Granton, Edinburgh.</i> |
| 1882 | Harris, Frederick, |
| 1882 | Harris, William James,
<i>75, Linden-gardens, Bayswater, W.</i> |
| 1883 | Harrowby, The Right Hon., The Earl of
<i>39, Grosvenor-square, W.</i> |
| 1870 | Hartley, Fountain John,
<i>Gloucester House, 97, Cazenove-road, Uppr Clapton, N.</i> |
| 1881 | HARVEY, ALFRED SPALDING, B.A.,
<i>67, Lombard-street, E.C.</i> |
| 1880 | Hastings, George Woodyatt, M.P.,
<i>Barnard's-green House, near Malvern.</i> |
| 1876 | Hawkins, Alfred Templeton, F.R.G.S.,
<i>22, Budge-row, Cannon-street, E.C.</i> |
| 1879 | Hawksley, Thomas, C.E., F.R.S., &c.,
<i>30, Great George-street, Westminster, S.W.</i> |
| 1880 | Hazell, Walter,
<i>Ellerslie, Bromley, Kent.</i> |
| 1877 | Hedley, Thomas Fenwick,
<i>12, Park-place, West, Sunderland.</i> |
| 1870 | Hefford, George V.,
<i>Rugby.</i> |
| 1883 | Heilgers, Robert Phillip,
<i>22, Great St. Helens, E.C.</i> |
| 1860 | Helder, Stewart, F.I.A.,
<i>2, Broad Sanctuary, S.W.</i> |
| 1865 | Hendriks, Augustus, F.I.A.,
<i>7, Cornhill, E.C.</i> |
| 1855 | *HENDRIKS, FREDERICK,
<i>1, King William-street, E.C.</i> |
| 1858 | Herapath, Spencer, F.G.S.,
<i>18, Upper Phillimore-gardens, W.</i> |
| 1877 | *Herbage, William,
<i>London & South Western Bank, 7, Fenchurch-street, E.C.</i> |
| 1881 | Hewat, Archibald, F.I.A., F.F.A.,
<i>22, George-street, Edinburgh.</i> |
| 1883 | Hewlings, Henry Freeman,
<i>188, Fleet-street, E.C.</i> |
| 1834 | *HEYWOOD, JAMES, M.A., F.R.S., F.G.S.,
(Honorary Vice-President and Trustee),
<i>26, Palace-gardens, Kensington, W.; Athenæum Club, S.W.</i> |

Year of Election.	
1869	Hickson, Joseph, J.P., <i>Montreal, Canada.</i>
1875	Higham, Charles Daniel, F.I.A., 3, <i>Princes-street, Bank, E.C.</i>
1878	Hill, Frederick Morley, 22, <i>Richmond-road, Barnsbury, N.</i>
1873	Hime, Major H. W. L., R.A., <i>Woolwich.</i>
1859	Hincks, Hon. Sir Francis, K.C.M.G., C.B., <i>Montreal, Canada.</i>
1879	Hoare, Hamilton Noel, 37, <i>Fleet-street, E.C.</i>
1870	*Hoare, Henry, <i>Staplehurst, Kent.</i>
1834	*Hodge, William Barwick, F.I.A., 5, <i>Whitehall, S.W.</i>
1874	Hood, Charles, F.R.S., F.R.A.S., 10, <i>Leinster-gardens, Hyde-park, W.</i>
1871	Hooper, Angus Cameron, <i>Montreal, Canada.</i>
1874	Hooper, Rev. George D., "Ellerslie," <i>Sunny Gardens, Hendon, N.W.</i>
1879	Hooper, George Norgate, <i>Elmleigh, Hayne-road, Beckenham, Kent.</i>
1878	HOOPER, WYNNARD, 2, <i>Pembroke-gardens, Kensington, W.</i>
1855	HOUGHTON, THE RIGHT HON. LORD, D.C.L., F.R.S. (Honorary Vice-President), <i>Fryston Hall, Ferrybridge, Yorkshire.</i>
1883	Howell, Francis Buller, 6, <i>Upper Wimpole-street, W.</i>
1883	Howell, George, <i>Hampden House, Ellingham-road, W.</i>
1876	Hoyle, William, <i>Claremont, Tottington, near Bury, Lancaster.</i>
1853	*Hubbard, The Right Hon. John Gellibrand, M.P., <i>Bank of England, E.C.</i>
1864	Hudson, Thomas, 4, <i>St. Ann's-road, Brixton, S.W.</i>
1878	Hughes, John, 3, <i>West-street, Finsbury-circus, E.C.</i>
1883	Hull, E. C. P., 1, <i>Fenchurch-avenue, E.C.</i>
1872	Humphreys, George, M.A., F.I.A., 79, <i>Pall Mall, S.W.</i>
1871	HUMPHREYS, NOEL ALGERNON, <i>General Register Office, Somerset House, W.C.</i>
1873	Hunt, Sir Henry Arthur, C.B., 54, <i>Eccleston-square, S.W.</i>

Year of
Election.

- 1883 Hunt, Richard, A., A.I.A.,
Moor-street, Birmingham.
- 1857 Hurst, George,
King's Brook House, St. Mary's, Bedford.
- 1877 Huskinson, Thomas,
Epperstone Manor, Nottingham.
- 1879 Hyde, Major-General Henry, R.E.,
India Office, Westminster, S. W.
- 1866 Ince, Henry Bret, Q.C.,
20, Old-square, Lincoln's-inn, W.C.
- 1869 Ingall, Samuel, F.R.G.S.,
Kent-end, Forest-hill, Kent. S. E.
- 1874 *Ingall, William Thomas Fitzherbert Mackenzie,
50, Threadneedle-street, E.C.
- 1869 *Inglis, Cornelius, M.D.,
Athenæum Club, S.W.
- 1839 Irving, John,
94, Eaton-place, S.W.
- 1864 *Ivey, George Pearse,
80, King-street, Manchester.
- 1880 *Jackson, William Lavies, M.P.,
Chapelallerton, Leeds.
- 1879 Jamieson, George Auldjo,
58, Melville-street, Edinburgh.
- 1872 JANSON, FREDERICK HALSEY, F.L.S.,
41, Finsbury-circus, E.C., and Oak Bank, Chislehurst.
- 1878 Jeans, James Stephen,
Victoria Mansions, Victoria-street, Westminster, S.W.
- 1883 Jenkins, Benjamin,
3, Fenchurch-avenue, E.C.
- 1879 Jephson, Henry L. (*Chief Secretary's Office*),
Dublin Castle, Ireland.
- 1881 *Jersey, The Right Hon. the Earl of,
3, Great Stanhope-street, W.
- 1881 Johnson, E. Eltham,
110, Cannon-street, E.C.
- 1871 Johnson, Edmund,
1, Castle-street, Holborn, E.C.
- 1880 Johnson, Walter,
Rounton Grange, Northallerton
- 1872 Johnston, Francis J.,
Lamas, Chislehurst.

Year of Election.	
1881	Johnston, Rev. James, <i>Glenceve, Highland-road, Upper Norwood, S.E.</i>
1883	Johnston, Thomas, <i>Broomsleigh Park, Seal, Sevenoaks.</i>
1878	Johnstone, E., <i>14, Abbeville-road, Cavendish-road, Clapham, S.W.</i>
1878	Jones, Henry R. Bence, <i>1, Whitehall, S.W.</i>
1874	Jones, Herbert, <i>15, Montpelier-row, Blackheath, S.E.</i>
1882	Jones, John, <i>12A, King Edward's-road, Hackney, E.</i>
1880	Jones, Robert Hesketh, <i>The Briars, Crystal Palace Park, Sydenham, S.E.</i>
1877	Jones, Theodore Brooke, <i>Georgeville, Harrogate, Yorks.</i>
1873	Jones, Sir Willoughby, Bart., M.A., <i>Cranmer Hall, Fakenham, Norfolk.</i>
1883	Joseph, Samuel S., <i>29, Hyde Park-gardens, W.</i>
1858	Jourdan, Francis, <i>Avenue House, Hampstead, N.W.</i>
1877	Karuth, Frank O., <i>City Liberal Club, Walbrook, E.C.</i>
1873	Kay, Duncan James, <i>60, Queen's-gate, S.W.</i>
1877	Kealy, James William, <i>26, Moorgate-street, E.C.</i>
1874	Kelly, Charles, M.D., <i>Worthing, Sussex.</i>
1867	Kelly, Edward Robert, A.M., <i>51, Great Queen-street, Lincoln's-inn-fields, W.C.</i>
1878	Kelsey, Joseph Francis, <i>Government Statistician, Mauritius.</i>
1883	Keltie, John Scott, <i>30, Bedford-street, Covent Garden, W.C.</i>
1873	Kemp, Samuel, <i>Oriel House, Bath.</i>
1878	Kennedy, J. Murray, <i>New University Club, St. James's-street, S.W.</i>
1878	Kennedy, Thomas, <i>11, Old Jury-chambers, E.C.</i>
1871	Kennelly, David J., <i>Devonshire Club, St. James's, S.W.</i>

Year of
Election.

- 1883 *Keynes, John Neville, M.A., B.Sc.
6, *Harvey-road, Cambridge.*
- 1852 Kimberley, The Right Honourable the Earl of, M.A., P.C.,
35, *Lowndes-square, S.W.*
- 1883 *King, Bolton, B.A.,
10, *Upper Berkeley-street, W.*
- 1878 King-Harman, Colonel Edward Robert, M.P.,
Rockingham, Boyle, Ireland.
- 1879 Kirkwood, Anderson, LL.D.,
Melville-terrace, Stirling, N.B.
- 1872 Knight, John Peake,
London, Brighton, & S. Coast Rail., London Bridge, E.C.
- 1878 *Kusaka, Yoshio,
First National Bank, Tokio, Japan.
- 1869 Kyshe, John Benjamin,
Colonial Office, Downing-street, S.W.
- 1880 Lamprey, Joshua Henry,
17, *St. Anne's-park, Wandsworth, S.W.*
- 1875 Lane, Thomas,
Percy Cottage, Eastbourne.
- 1874 Lang, George Murray, R.N.,
18, *Cheyne-walk, Chelsea, S.W.*
- 1881 Langton, Henry Curren,
Docklands, Ingatestone, Essex.
- 1883 Last, W. Harrison,
Inland Revenue, Somerset House, W.C.
- 1877 Laurance, Henry,
39, *Old Bond-street, W.*
- 1878 Law, The Right Hon. Hugh,
- 1874 Lawes, Sir John Bennett, Bart., LL.D., F.R.S., F.C.S.,
Rothamsted-park, St. Albans.
- 1878 Lawrence, Alexander M.,
99, *South Hill Park, Hampstead, N.W.*
- 1873 Lawrie, James, F.R.G.S.,
Kelvin House, Quadrant-road, Highbury, N.
- 1883 Lawson, Charles Henry,
Green's End, Woolwich.
- 1873 LAWSON, ROBERT (Vice-President, Inspector-General of Army
Hospitals), 20, *Lansdowne-road, Notting-hill, W.*
- 1873 Lea, Thomas, M.P.,
14, *Elvaston-place, Queen's-gate, S.W.*
- 1883 *Leadam, Isaac Saunders, M.A.,
117, *St. George's-square, S.W.*

Year of Election.	
1883	Lee, Henry, M.P., <i>Reform Club, S.W.</i>
1880	Lee, Lionel Frederic, (<i>Ceylon Civil Service</i>), <i>ex H. Austin Lee, Foreign Office, Downing-street, S.W.</i>
1879	*Leete, Joseph, <i>36, St. Mary-at-hill, E.C. (Eversden, S. Norwood Park.)</i>
1883	Lefaux, Alfred J., <i>12, Clarendon Villas, Charlton, Kent.</i>
1877	LEFEVRE, THE RIGHT HON. GEORGE SHAW, M.P., <i>(Honorary Vice-President), 18, Bryanston-square, W.</i>
1877	*Leggatt, Daniel, LL.D., <i>5, Raymond-buildings, Gray's-inn, W.C.</i>
1880	Leighton, Stanley, M.P., <i>Sweeney Hall, Oswestry, Salop.</i>
1851	LEVI, PROFESSOR LEONE, LL.D., F.S.A., <i>5, Crown Office-row, Temple, E.C.</i>
1867	Lewis, Charles Edward, M.P., <i>8, Old Jewry, E.C.</i>
1877	Lewis, John, <i>7, Waterloo-street, Birmingham.</i>
1862	Lewis, Robert, <i>1, Bartholomew-lane, E.C.</i>
1877	Ligertwood, Thomas, M.D., F.R.C.S., <i>Royal Hospital, Chelsea, S.W.</i>
1845	*Lister, William,
1878	Lloyd, Thomas, <i>13, Angel-court, Throgmorton-street, E.C.</i>
1879	Lloyd, Wilson, F.R.G.S., <i>Myrod House, Wood-green, W. E. S.</i>
1882	*Longstaff, George Blundell, M.A., M.B., <i>Southfield Grange, West Hill-road, Wandsworth, S.W.</i>
1876	*Lornie, John Guthrie, J.P., <i>Rosemount, Kirkcaldy; (of Birnam and Pitcastle) N.B.</i>
1879	Lovegrove, Mrs., <i>28, Park-street, Grosvenor-square, W.</i>
1834	Lovelace, The Right Honourable the Earl of, F.R.S., <i>East Horsley Park, Ripley, Surrey.</i>
1880	Lovely, William, R.N., <i>Avenue House Hammersmith, W.</i>
1879	Lowndes, William Layton, J.P., D.L., <i>United University Club, Pall Mall East, S.W.</i>
1875	Loyd, William Jones, J.P., <i>Langleybury, Watford.</i>
1865	LUBBOCK, SIR JOHN, BART., M.P., F.R.S., (<i>Trustee</i>), <i>High Elms, Farnborough, Kent.</i>
1882	Lubbock, Nevile, <i>Leasons, Chislehurst, Kent.</i>
1878	Lucas, Thomas, J.P., <i>5, Great George-street, Westminster, S.W.</i>

Year of
Election.

- 1878 Lusk, Sir Andrew, Bart., M.P., J.P.,
15, *Sussex-square, Hyde Park, W.*
- 1881 Lytton, The Right Hon. Earl of. G.C.B., G.C.S.I.,
Knebworth, Stevenage, Herts.
- 1875 Mabson, Richard Rous,
Ilford, Essex.
- 1873 *Macandrew, William, J.P.,
Westwood, near Colchester.
- 1873 McArthur, Alexander, M.P.,
Raleigh Hall, Brixton, S.W.
- 1873 McArthur, Alderman Sir William, K.C.M.G., M.P.,
1, *Gwydyr Houses, Brixton Rise, S.W.*
- 1883 McCabe, H.B.,
348, *Uxbridge-road, W., and 45, Friday-street, E.C.*
- 1879 MacCarthy, Rev. E. F. M., M.A.,
47, *Hagley-road, Edgbaston, Birmingham.*
- 1867 Mc'Clean, Frank,
23, *Great George-street, Westminster, S.W.*
- 1873 McDermott, Edward,
Hill Side, Grove-park, Cumberwell, S.E.
- 1881 Macdonald, Charles McCay,
9, *Dowgate-hill, E.C.*
- 1872 Macdonell, John,
4, *Elm-court, Temple, E.C.*
- 1873 *McEwen, Laurence T.,
c/o R. A. McLean, 1, Queen Victoria-street, E.C.
- 1873 McGarel-Hogg, Colonel Sir James, Bart., M.P.,
17, *Grosvenor-gardens, S.W.*
- 1882 McGuire, Patrick,
57, *Amherst-street, Calcutta.*
- 1879 MacIver, David, M.P.,
34, *Lancaster-gate, W.*
- 1878 McKewan, William,
21, *Lombard-street, E.C.*
- 1881 Mackey, Rev. Canon Donald J., B.A., Cantab
The Chantry, Balhousie, Perth, N.B.
- 1876 *McLean, Robert Allan, F.R.G.S.,
1, *Queen Victoria-street, E.C.*
- 1863 *Maclure, J. W., J.P., &c.,
Carlton Club; The Home, Whalley Range, Manchester.
- 1875 Macpherson, Hugh Martin, F.R.C.S., (*Inspector-General*),
14, *St. James's-square, S.W.*

Year of Election.	
1883	Macqueen, R. D. Barkly, 20, <i>Addison-gardens North, W.</i>
1882	McRosty, Alexander, 13, <i>King's Arms-yard, E.C.; West Bank, Esher.</i>
1880	Maddison, Edward C., 31, <i>Lombard-street, E.C.</i>
1877	*Maple, John Blundell, 8, <i>Clarence-terrace, Regent's-park, N.W.</i>
1875	Marsh, Alfred, 85, <i>Gracechurch-street, E.C.</i>
1880	*Marshall, A., 46, <i>Woodstock-road, Oxford.</i>
1873	Martin, Henry, <i>National Bank of India, 39a, Threadneedle-street, E.C.</i>
1874	*MARTIN, JOHN BIDDULPH, M.A., F.Z.S., (<i>Foreign Secretary</i>), 32, <i>Courtyard-gardens, Cromwell-road, S.W.</i>
1877	Martin, Josiah, F.I.A., 32, <i>New Bridge-street, E.C.</i>
1872	*MARTIN, RICHARD BIDDULPH, M.P., (<i>Treasurer</i>), 68, <i>Lombard-street, E.C., and Chislehurst.</i>
1876	*Martin, Thomas Jaques, 84, <i>Collins-street West, Melbourne, Victoria.</i>
1879	Martin, Waldyve A. Hamilton, <i>The Elms, Coates, Cirencester.</i>
1875	*Mathers, John Shackleton, <i>Hunover House, Leeds, Yorkshire.</i>
1883	Matheson, Frederic C., <i>Beechworth, Hampstead, N.W.</i>
1870	Maxse, Rear-Admiral Frederick A., <i>Herm House, Upperton-road, Eastbourne.</i>
1874	May, Frank, <i>Bank of England, Threadneedle-street, E.C.</i>
1882	Medhurst, J. T., 126, <i>Narrow-street, Limehouse, E.</i>
1883	*Medley, George W., <i>Oakwood, Camden, Chislehurst.</i>
1853	*Meikle, James, F.I.A., 6, <i>St. Andrew's-square, Edinburgh.</i>
1880	Menzies, R. Stewart, <i>Hallyburton, Coupar-Angus, N.B.</i>
1861	Messent, John, F.I.A., 429, <i>West Strand, W.C.</i>
1881	Meyer, Robert Alexander, 40A, <i>Queen's Mansions, Victoria-st., Westminster, S.W.</i>
1875	Mildmay, Henry Bingham, J.P., 8, <i>Bishopsgate-street Within, E.C.</i>
1873	Millar, William Henry, <i>Cleveland Lodge, New Park-road, Brixton-hill, S.W.</i>
1877	Miller, Robert Ferguson, <i>Ramsden-square, Barrow-in-Furness.</i>

Year of Election.	
1879	Miller, William, 67, <i>Queen Victoria-street, E.C.</i>
1878	Mills, Sir Charles Henry, Bart., M.P., <i>Camelford House, Park-lane, W.</i>
1882	Milnes, Alfred, M.A., 30, <i>Almeric-road, Wandsworth, S.W.</i>
1874	*Mocatta, Frederick D., F.R.G.S., 9, <i>Connaught-place, W.</i>
1878	Moffat, Robert J., <i>The Chesnuts, Great Shelford, Cambridgeshire.</i>
1883	Moffatt, George, 6, <i>Lime-street, E.C.</i> , and 29, <i>Eastbourne-terrace, W.</i>
1879	Moore, Alfred, C.E., 5, <i>Clarence-street, Manchester.</i>
1874	Moore, Charles Rendall, 46, <i>Brockley-road, Lewisham-road, S.E.</i>
1877	Moore, Edward, 3, <i>Crosby-square, E.C.</i>
1883	Moore, Henry Jackson, 14, <i>Clarence-square, Cheltenham.</i>
1878	*Moore, John Byers Gunning, <i>Loymount, Cookstown, Ireland.</i>
1880	More, Robert Jasper, <i>Linley Hall, Bishopscastle, Salop.</i>
1883	Morgan, Henry James, <i>Ottawa, Canada.</i>
1883	Morgan, James Henry, 126, <i>Narrow-street, Limehouse, E.</i>
1872	Morgan, Octavius Vaughan, J.P., 13, <i>Boltons, South Kensington, S.W.</i>
1881	Morison, Arthur Duff, 23, <i>Regency-street, Westminster, S.W.</i>
1873	*Morley, Samuel, M.P., 18, <i>Wood-street, E.C.</i> ; 34, <i>Grosvenor-street, W.</i>
1874	*Morris, James, M.D., F.R.C.S., 13, <i>Somers-place, Hyde-park-square, W.</i>
1877	Mort, William, 1, <i>Stanley-crescent, Notting-hill, W.</i>
1873	Morton, James, 1, <i>Palmerston-buildings, Greenock, N.B.</i>
1847	*Mouat, Frederic J., M.D., F.R.C.S., 12, <i>Durham-villas, Kensington, W.</i>
1857	*Mount-Temple, The Right Hon. Lord, 15, <i>Great Stanhope-street, W.</i>
1878	Muir, Hugh Brown, 26, <i>Old Broad-street, E.C.</i>
1883	Muirhead, H. J., <i>Oakwood, Farquhar-road, Upper Norwood, S.E.</i>
1880	Mulhall, Michael G., 19, <i>Albion-street, Hyde Park, W.</i>

Year of Election.	
1878	*Mundella, The Right Hon. Anthony John, M.P., F.R.S., 16, <i>Elvaston-place, Queens-gate, S.W.</i>
1878	Murray, Adam, 104, <i>King-street, Manchester.</i>
1879	Murray, James Charles, <i>Calcutta.</i>
1883	Murray, Kenrie B., 84, <i>King William-street, E.C.</i>
1879	Nalder, Francis Henry, <i>Findern Lodge, Spring-grove, Isleworth.</i>
1865	Nasmith, David, 4, <i>Garden-court, Temple, E.C.</i>
1878	*Nathan, Henry, 110, <i>Portsdown-road, Maida-vale, W.</i>
1879	Neil, William M., 64, <i>Seymour-street, Portman-square, W.</i>
1854	Neild, Alfred, <i>Mayfield Print Works, Manchester.</i>
1869	NEISON, FRANCIS G. P., 93, <i>Adelaide-road, South Hampstead, N.W.</i>
1879	NEPEAN, EVAN COLVILLE, <i>War Office, Pall Mall, S.W.</i>
1877	Nevill, Charles Henry, 11, <i>Queen Victoria-street, E.C.</i>
1862	Newbatt, Benjamin, F.I.A., F.R.G.S., 13, <i>St James's-square, S.W.</i>
1881	Newcome, Frederick N., 2, <i>Oxford-villas, Church-row, Watford.</i>
1879	Newdegate, Charles Newdigate, M.P., D.C.L., 27, <i>Lowndes-street, Belgrave-square, S.W.</i>
1883	Newmarch, Mrs. Elizabeth, <i>Brook House, Addlestone, Surrey.</i>
1878	Newport, Henry R., 1, <i>Whitehall, S.W.</i>
1878	Newton, John, <i>Ash Lea, Croydon-road, Penge, S.E.</i>
1878	Nicholson, Professor J. S., <i>University of Edinburgh.</i>
1858	Nightingale, Miss Florence, 10, <i>South-street, Park-lane, W.</i>
1877	Nix, Samuel Dyer, F.C.A., 3, <i>King-street, Chancery-side, E.C.</i>

Year of
Election.

- 1871 *Noble, Benjamin,
North-Eastern Bank, Newcastle-on-Tyne.
- 1870 Noble, John,
42, Burghley-road, Highgate-road, N.W.
- 1883 Norfolk J. Ernest Walter,
95, Farringdon-street, E.C.
- 1877 Norman, General, Sir Henry Wylie, K.C.B.,
King's House, Jamaica.
- 1878 Northbrook, The Right Hon. the Earl of, G.C.S.I., D.C.L.,
4, Hamilton-place, Piccadilly, W.
- 1878 Notthafft, Theodor,
c/o Discount Bank, St. Petersburg.
- 1880 Oakeshott, George Alfred,
Secretary's Office, General Post Office, E.C.
- 1880 *Oelsner, Isidor,
Highfield, Westwood-park, Forest-hill, S.E.
- 1862 Ogbourne, Charles Henry,
Fairlawn, Bath-road, Reading.
- 1878 O'Hagan, The Right Hon. Lord,
Hereford House, Park-street, Grosvenor-square, W.
- 1878 Oppenheim, Henry,
16, Bruton-street, Bond-street, W.
- 1876 Orange, William, M.D.,
Broadmoor, Wokingham, Berks.
- 1877 Ormond, Richard,
24, Grainger-street West, Newcastle-on-Tyne.
- 1874 Overall, William Henry, F.S.A.,
*Librarian, Guildhall, E.C. (Representing the Library
Committee of the Corporation of the City of London.)*
- 1866 *Palgrave, Robert Harry Inglis, J.P., F.R.S.,
11, Britannia-terrace, Great Yarmouth, Norfolk.
- 1883 Palmer, Charles,
Calcutta.
- 1879 Palmer, George, M.P.,
68, Grosvenor-street, W.; and The Acacias, Reading.
- 1878 Park, David Francis, C.A., F.F.A., A.I.A.,
17, Change-alley, Cornhill, E.C.
- 1880 Parkin, William,
The Mount, Sheffield.

Year of Election.	
1881	Parr, Samuel, 7, <i>Finsbury-square, E.C.</i>
1878	Parry, Thomas, <i>Grafton-place, Ashton-under-Lyne.</i>
1879	Partridge, Henry Francis, L.D.S., &c., <i>Sussex House, Sussex-place, South Kensington, S.W.</i>
1883	Paterson, John, 35, <i>Walbrook, E.C.</i>
1869	Patterson, Robert Hogarth, 22, <i>Wingate-road, Hammersmith, W.</i>
1877	Paul, Henry Moncreiff, 12, <i>Lausdowne-crescent, Notting Hill, W.</i>
1878	Paulin, David, 31, <i>Stafford-street, Edinburgh.</i>
1879	Payn, Howard, 21, <i>Gilbert-street, Grosvenor-square, W.</i>
1876	Pearson, Edwin James, <i>Board of Trade, Whitehall Gardens, S.W.</i>
1857	*Pearson, Professor C. H., <i>c/o John Pearson, Esq., Q.C., 75, Onslow-square, S.W.</i>
1880	*Pease, Sir Joseph Whitwell, Bart., M.P., 24, <i>Kensington-palace-gardens, W.</i>
1876	*Peck, Sir Henry William, Bart., M.P., <i>Wimbledon House, S.W.</i>
1878	Pellereau, Etienne, <i>Procureur and Advocate-General, Port Louis, Mauritius.</i>
1880	Pender, John, M.P., (66, <i>Old Broad-street, E.C.</i>) 18, <i>Arlington-street, S.W.</i>
1871	Pennington, Frederick, M.P., 17, <i>Hyde Park-terrace, W.</i>
1874	Pepys, The Hon. George,
1881	Perring, R. B., <i>Queen's Chambers, John Dalton-street, Manchester.</i>
1883	Petheram, Frederick William, F.C.A., 2, <i>Lombard-court, E.C.</i>
1874	Phené, John Samuel, LL.D., F.S.A., 5, <i>Carlton-terrace, Oakley-street, S.W.</i>
1879	Philips, Herbert, 35, <i>Church-street, Manchester.</i>
1877	Phillips, Henry Matthews, 41, <i>Seething-lane, E.C.</i>
1835	*Phillips, Sir George Richard, Bart., 22, <i>Hill-street, Berkeley-square, W.</i>
1859	Phillips, Henry James, 4, <i>Ludgate-hill, E.C.</i>
1883	Phillips, J. O., <i>Horseferry-road, Westminster, S.W.</i>
1877	Phillips, John Walter, M.B., L.R.C.S. Edin., 30, <i>Stanley-street, West Melbourne, Victoria, Australia.</i>

Year of Election	
1878	Phipps, Pickering, M.P., 6, <i>Collingtree Grange, Northampton.</i>
1871	*Pickering, John, F.R.G.S., F.S.A., <i>Stoney Royd, Ilkley, Yorkshire.</i>
1878	*Pim, Joseph Todhunter, <i>Greenbank, Monkstown, County Dublin.</i>
1838	*Pinckard, George Henry, J.P., F.I.A., 12, <i>Grove-road, St. John's-wood, N.W.</i>
1879	Pixley, Francis William, 5, <i>Upper Westbourne-terrace, Hyde Park, W.</i>
1881	Planck, Charles, M.R.C.S. (<i>Deputy Surgeon-General</i>), <i>Allahabad, India.</i>
1883	Platt, James, <i>Rookwood, Hampstead, N.W.</i>
1861	Plowden, W. Chicele (<i>Census Commissioner for India</i>), 101, <i>Eaton-square, S.W.</i>
1869	POCHIN HENRY DAVIS, J.P., <i>Bodnant Hall, Eglwysbach, R.S.O. Denbighshire.</i>
1874	Ponsonby, The Hon. Frederick George Brabazon, M.A., 3, <i>Mount-street, Grosvenor-square, W.</i>
1883	Pope, William Agnew, <i>Merrington House, Bolton Gardens, South Kensington, W.</i>
1879	*Powell, Francis Sharp, M.P., F.R.G.S., (<i>Horton Old Hall, Bradford</i>), 1, <i>Cambridge-square, Hyde Park, W.</i>
1871	Power, Edward, 16, <i>Southwell-gardens, South Kensington, S.W.</i>
1883	Poynting, Professor J. H., M.A., <i>Brentwood, Hagley-road, Edgbaston, Birmingham.</i>
1877	*Prance, Reginald Heber, <i>Frogna, Hampstead, N.W.</i>
1877	Praschkauer, Maximilian, 10, <i>Priory-grove, Boltons, S.W.</i>
1867	*Pratt, Robert Lindsay, 80, <i>Bondgate, Darlington</i>
1879	Price, James, F.R.G.S., 53, <i>Redcliffe-gardens, South Kensington, W.</i>
1871	Puleston, John Henry, M.P., 2, <i>Bank-buildings, E.C.</i>
1837	*Purdy, Frederick, 35, <i>Victoria-road, Kensington, W.</i>
1879	Quail, Jesse, 27, <i>Mill-street, Whitehaven.</i>

Year of
Election.

- 1874 Quain, Richard, M.D., F.R.S., F.R.C.P.,
67, *Harley-street, W.*
- 1883 Quoadt, Ferdinand,
28, *Mark-lane, E.C.*
- 1883 Rabbidge, Richard, F.C.A.,
32, *Poultry, E.C.*
- 1872 *Rabino, Joseph, (*care of Crédit Lyonnais*),
Alexandria, Egypt.
- 1858 *Radstock, The Right Honourable Lord,
East Sheen, Mortlake, S.W.
- 1877 Raikes, Captain George Alfred, F.S.A., F.R. His. Soc.,
63, *Belsize-park, Hampstead, N.W.*
- 1864 *Raleigh, Samuel,
9, *St. Andrew-square, Edinburgh.*
- 1883 Rama Varma, His Highness, Bahadoor, G.C.S.I.,
(Maharajah of Travancore),
c/o Patrick Doyle, Esq., C.E., Bellary, Madras.
- 1860 Ramsay, Alexander Gillespie, F.I.A.,
Canada Life Assurance, Hamilton, Canada West.
- 1874 Ramsden, Sir James, of Barrow, D.L.,
Furness Abbey, Lancashire.
- 1870 Ranken, William Bayne,
- 1880 Rankin, James, M.P.,
35, *Eunismore-gardens, Prince's Gate, S.W.*
- 1881 Raper, Robert George,
Chichester.
- 1865 Rateliff, Colonel Charles, J.P.,
26, *Lancaster-gate, Hyde Park, W.*
- 1859 Rathbone, P. H.,
Greenbank Cottage, Liverpool.
- 1878 Rathbone, William, M.P.,
18, *Prince's-gardens, Prince's-gate, S.W.*
- 1874 Ravenstein, Ernest George, F.R.G.S.,
29, *Lambert-road, Brixton Rise, S.W.*
- 1877 *Rawlins, Thomas,
45, *King William-street, E.C.*
- 1835 RAWSON, SIR R. W., K.C.M.G., C.B. (*Vice-President*),
68, *Cornwall-gardens, Queen's-gate, S.W.*
- 1880 Readdy, George,
13, *Harrington-street, Liverpool.*

Year of
Election

- 1875 Record, John,
23, *Kenninghall-road, Clapton, E.*
- 1879 Rhodes, John G.,
Oakdene, Beckenham, Kent.
- 1876 Rice, Thomas Fitzroy,
Horseheads, New York, U.S.A.
- 1873 Ripon, The Most Hon. the Marquess of, K.G., F.R.S, &c.,
1, *Carlton-gardens, S.W.*
- 1880 Roberts, A. F.,
49, *Bow-lane, Cheapside, E.C.*
- 1882 Roberts, Edward, F.R.A.S., (*Nautical Almanac Office*),
3, *Verulam-buildings, Gray's Inn, W.C.*
- 1868 ROBINSON, SIR WILLIAM ROSE, K.C.S.I.,
50, *Norfolk-square, Hyde-park, W.*
- 1880 *Ronald, Byron L.,
14, *Upper Phillimore-gardens, W.*
- 1880 Ronald, Robert Bruce,
- 1883 Roscoe, Henry William Kent,
69, *Cadogan-place, S.W.*
- 1873 *Rosebery, The Right Hon. the Earl of,
Lansdowne House, Berkeley-square, W.
- 1834 *Ross, David, of Bladensburg,
Rostrevor, Co. Down, Ireland.
- 1883 Ross, John Grafton,
Oriental Club, Hanover-square, W.
- 1880 Roth, Henry Ling,
Foulden, Mackay, Queensland, Australia.
- 1865 Ruck, George T.,
The Hawthorns, Dorville-road, Lee, S.E.
- 1879 Runtz, John,
Linton Lodge, Lordship-road, Stoke Newington, N.
- 1878 Russell, Richard F.,
8, *John-street, Adelphi, W.C.*
- 1874 Rutherford, Charles,
12, *Queen-street, E.C.*
- 1873 *Salisbury, The Most Hon. the Marquess of, P.C., F.R.S.,
20, *Arlington-street, W.*
- 1881 Salmon, James,
Melford Lodge, Wanstead, Essex.
- 1875 *Salomons, Sir David Lionel, Bart., J.P.,
Broom-hill, Tunbridge Wells.
- 1876 Salt, Thomas, M.P.,
Weeping Cross, Stafford.

Year of Election.	
1868	Samuelson, Bernhard, M.P., 56, <i>Prince's-gate, Hyde-park, S.W.</i>
1860	Sargant, William Lucas, <i>Edgbaston, Birmingham.</i>
1877	Saunders, Charles Edward, M.D., 21, <i>Lower Seymour-street, Portman-square, W.</i>
1874	Saunders, Francis, 6, <i>Limes-grove, Lewisham, S.E.</i>
1852	Saunders, James Ebenezer, jun., F.G.S. 9, <i>Finsbury-circus, E.C.</i>
1879	Saunders, William, <i>Mount View, Streatham, S.W.</i>
1883	Schidrowitz, Dr. Samuel, 37, <i>Ladbroke Grove-road, Notting Hill, W.</i>
1877	Schiff, Charles,
1877	Schneidan, Charles John, 6, <i>Westwick-gardens, West Kensington-park, W.</i>
1880	Schreiber, Charles, M.P., <i>Langham House, 11, Portland-place, W.</i>
1883	Schwann, John Frederick, <i>Oakfield, Wimbledon, and 6, Moorgate-street, E.C.</i>
1883	Sclanders, Alexander, 10, <i>Austin Friars, E.C.</i>
1878	Scott, Arthur J., 22, <i>Grafton-street, New Bond-street, W.</i>
1880	*Seeley, Charles, jun., M.P., <i>Sherwood Lodge, Nottingham.</i>
1883	Seligman, Isaac, <i>Lincoln House, Clapham Park, S.W.</i>
1873	Seyd, Richard, 38, <i>Lombard-street, E.C.</i>
1841	SHAFTESBURY, THE RIGHT HON. THE EARL OF, K.G., (<i>Honorary Vice-President</i>), 24, <i>Grosvenor-square, W.</i>
1883	Shelford, Thomas, 39, <i>Lime-street, E.C.</i>
1879	Shepherd, Wallwyn Poyer B., M.A., 24, <i>Old Buildings, Lincoln's Inn, W.C.</i>
1871	Sidgwick, Henry, <i>Trinity College, Cambridge.</i>
1878	Simmonds, G. H., 1, <i>Whitehall, S.W.</i>
1850	Singer, Charles Douglas, 9, <i>The Terrace, Upper Clapton, E.</i>
1882	Skinner, C. Weeding, <i>Hill Crest, Theydon Bois, Essex.</i>
1881	Skrine, Francis Henry, <i>United Service Club, Calcutta, India.</i>

Year of Election.	
1883	Sly, Richard Stevens, 6, <i>Cornwall-street, E.</i>
1869	Smee, Alfred Hutcheson, M.R.C.S., <i>The Grange, Wallington, Surrey.</i>
1878	*Smith, Charles, M.R.I.A., F.G.S., Assoc. Inst. C.E., <i>Barrow-in-Furness.</i>
1883	Smith, C. Ridley, 32, <i>Nicholas-lane, Lombard-street, E.C.</i>
1883	*Smith, The Hon. Donald A., 1157, <i>Dorchester-street, Montreal, Canada.</i>
1874	Smith, Edward, <i>St. Mildred's House, Poultry, E.C.</i>
1871	Smith, E. Cozens, 1, <i>Old Broad-street, E.C.</i>
1883	Smith, E. Woodley, A.C.A., 28, <i>Budge-row, Cannon-street, E.C.</i>
1878	*Smith, George, LL.D., C.I.E., <i>Serampore House, Napier-road, Edinburgh.</i>
1877	Smith, Howard S., 37, <i>Bennett's Hill, Birmingham.</i>
1878	*Smith, James, <i>South Indian Railway, Negapatam, Madras.</i>
1880	Smith, Jervoise, 1, <i>Lombard-street, E.C.</i>
1877	Smith, John, 8, <i>Old Jewry, E.C.</i>
1879	Smith, J. Fisher, 76, <i>Cheapside, E.C.</i>
1883	Smith, Samuel, M.P., <i>West Hill Side, Clapham Common, S.W.</i>
1880	Smith, Thomas Sherwood, 21, <i>Richmond-terrace, Clifton, Bristol.</i>
1867	*Smith, The Right Honourable William Henry, M.P., 3, <i>Grosvenor-place, S.W.</i>
1855	Sowray, John Russell, <i>Office of Woods, 2, Whitehall-place, S.W.</i>
1877	Spalding, Samuel, <i>South Darenth, Kent.</i>
1882	Spence, Thomas E. J., LL.B., <i>Yorkshire Society's School, Westminster Bridge-road, S.E.</i>
1867	*Spencer, Robert James, <i>High-street, Portsmouth.</i>
1876	Spensley, The Hon. Howard, F.R.G.S., 12, <i>Earl's Court-square, South Kensington, S.W.</i>
1881	Spice, Robert Paulson, C.E., 21, <i>Parliament-street, Westminster, S.W.</i>
1883	Spicer, Albert, <i>Woodford, Essex and 50, Upper Thames-street, E.C.</i>
1856	*Sprague, Thomas Bond, M.A., F.I.A., 26, <i>St. Andrew-square, Edinburgh.</i>

Year of Election.	
1872	Spriggs, Joseph, <i>Dale Cottage, Foxton, near Market Harbro'.</i>
1882	Stack, Thos. Neville, <i>5, D'Olier-street, Dublin.</i>
1856	*Stainton, Henry Tibbats, <i>Mountsfield, Lewisham, S.E.</i>
1881	Stancliffe, Frederick, <i>42, St. John-street, Montreal, Canada.</i>
1877	Stanford, Edward, <i>13 and 14, Long Acre, W.C.</i>
1877	Staples, Sir Nathaniel Alexander, Bart., <i>Lissan, Cookstown, Tyrone, Ireland; 4, Savile-row, W.</i>
1880	Stark, James, <i>17, King's Arms-yard. E.C.</i>
1880	Stephens, William Davies, J.P., <i>4, Abbotsford-terrace, Newcastle-on-Tyne.</i>
1882	*Stern, Edward D., <i>22, Queen's-gate, South Kensington, S.W.</i>
1883	Stone, Frank, <i>71, Bishopsgate-street, E.C.</i>
1877	Stone, William A., <i>90, Cannon-street, E.C.; West Hill Lodge, Dartford, Kent.</i>
1855	*Stott, John, F.I.A., <i>12, Essex-villas, Kensington, W.</i>
1865	Strachan, Thomas Young, F.I.A., <i>18, Grainger-street West, Newcastle-on-Tyne.</i>
1872	Strachey, General Richard, R.E., C.S.I., F.R.S., <i>India Office, Westminster, S.W.</i>
1880	Strutt, Hon. Frederick, <i>Milford House, near Derby.</i>
1880	*Summers, William, M.P. (<i>Sunnyside, Ashton-under-Lyne</i>), <i>Reform Club, Pall Mall, S.W.</i>
1881	Sykes, George Samuel, <i>1, Grant's Lane, Calcutta, India.</i>
1859	*Tait, Patrick Maenaghten, F.R.G.S., <i>39, Belsize Park, N.W.; and Oriental Club, W.</i>
1880	Taylor, George, <i>17, Abchurch-lane, E.C.</i>
1883	Taylor, Harry, <i>7, Albemarle-street, W.; and 9, Aldermanbury, E.</i>
1877	Taylor, John E., <i>12, Queen's Gate-gardens, South Kensington, S.W.</i>
1873	Taylor, Peter Alfred, M.P., <i>22, Ashley-place, Westminster, S.W.</i>

Year of Election.	
1838	*Taylor, General Pringle, K.H.,
1882	Temperley, Joseph, 1, <i>Cair's-buildings, Newcastle-on-Tyne.</i>
1880	Temple, Sir Richard, Bart., G.C.S.I., D.C.L., &c., <i>Carlton Club, Pall Mall, S.W.</i>
1879	Thomas, William Angell, <i>King's College, Strand, W.C.</i>
1879	Thomas, W. Cave, 53, <i>Welbeck-street, Cavendish-square, W.</i>
1878	Thompson, Alfred Boyle, F.R.C.P. Edin., 18, <i>Serjeants'-inn, Temple, E.C.</i>
1878	Thompson, Captain C. Halford (late R.A.), <i>Claremont, Exeter.</i>
1864	*Thompson, Henry Yates, 26a, <i>Bryanston-square, W.</i>
1868	Thomson, James, 35, <i>Nicholas-lane, E.C.</i>
1871	Thomson, Thomas D., 57, <i>Moorgate-street, E.C.</i>
1883	Thorburn, Alexander Brown, 17, <i>Marloes-road, Kensington, W.</i>
1883	Thubron, Robert, 1, <i>Queen-square, Newcastle-on-Tyne.</i>
1882	Tinker, James, 80, <i>Cromwell-road, S.W.</i>
1879	Tipping, William, <i>Oakfield House, Ashton-under-Lyne.</i>
1882	Tomkins, George, LL D., 132, <i>Piccadilly, W.</i>
1855	Tomline, Colonel George, 1, <i>Carlton House-terrace, S.W.</i>
1868	*Treatt, Frank Burford, <i>Immigration Office, Sydney, N.S. Wales.</i>
1868	Tritton, Joseph Herbert, 54, <i>Lombard-street, E.C.</i>
1883	Trouson, Norman, P. M., <i>Hope Park, Bromley, Kent.</i>
1880	Tupp, Alfred Cotterill (<i>Bengal Civil Service</i>), 6, <i>Harrington-street, Calcutta.</i>
1878	Turnbull, Alexander, 118, <i>Belsize park-gardens, N.W.</i>
1867	Turner, Thomas, <i>Ashley House, Kingsdown, Bristol.</i>
1878	Turton, William Woolley, <i>The Hollies, Bickley, Kent.</i>
1880	Twist, John Charles, 78, <i>Union-road, Hurst Brook, Ashton-under-Lyne.</i>

Year of
Election
1841

- Tyndall, William Henry,
92, *Cheapside, E.C.*
- 1873 Underdown, Robert George,
London-road Railway Station, Manchester.
- 1876 *URLIN, RICHARD DENNY,
22, *Stafford-terrace, Phillimore-gardens, W.*
- 1842 Valpy, Richard,
5, *Rutland-gate, S.W.*
- 1868 Vanderbyl, Philip,
Northwood, near Winchester.
- 1880 Van de Linde, Gérard, F.C.A.,
12, *Laurence Pountney-lane, Cannon-street, E.C.*
- 1883 Van Esen, J.,
55, *Threadneedle-street, E.C.*
- 1874 Vian, William John,
64, *Cornhill, E.C.*
- 1876 Vigers, Robert,
4, *Frederick's-place, Old Jewry, E.C.*
- 1877 Vine, John Richard Somers,
- 1873 Vivian, Major Quintus, D.L., F.R.G.S.,
17, *Chesham-street, S.W.*
- 1877 Waddy, Henry Edward, L.R.C.P., M.R.C.S.,
2, *Clarence-street, Gloucester.*
- 1883 Wahab, Edward,
14, *St. Mary Axe, E.C.*
- 1873 Wakeford, Henry,
Home Office, Whitehall, S.W.
- 1857 *Walford, Cornelius, F.I.A.,
86, *Belsize-park-gardens, N.W.*
- 1883 Walford, John Edward, C.C.,
Knightrider-street, E.C.

Year of
Election.

- 1871 *Walker, R. Bailey,
Ribblesdale Cottage, Wellington-road, Fallowfield.
- 1882 Wallen, Robert,
Harlech, Hawthorn, near Melbourne, Victoria.
- 1868 Wallis, Charles, J.,
21, *May Grove-road, Brondesbury, N.W.*
- 1880 Wallis, E. White, F.M.S.,
1, *Springfield-road, St. John's Wood, N.W.*
- 1876 Walter, Arthur Fraser,
15, *Queen's Gate-terrace, S.W.*
- 1877 Walter, Captain Edward,
Commissionaires' Office, 419, Strand, W.C.
- 1850 Walter, John, M.P.,
40, *Upper Grosvenor-street, W.*
- 1879 Wansey, Arthur H.,
Sambourne, Stoke Bishop, Bristol.
- 1873 Waring, Charles,
19B, *Grosvenor-square, S.W.*
- 1865 Waterhouse, Edwin, B.A.,
44, *Gresham-street, E.C.*
- 1873 Watson, J. Forbes, M.A., M.D., LL.D.,
16, *Lullington-road, Anerley, S.E.*
- 1883 Watson, T. Wilkinson,
151, *West George-street, Glasgow.*
- 1882 Watson, Walter,
52, *Balmes-road, Southgate-road, N.*
- 1883 Watson, William Livingstone,
7, *Wetherby-gardens, South Kensington, S.W.*
- 1865 Webster, Alphonsus,
44, *Mecklenburg-square, W.C.*
- 1873 Webster, James Hume,
14, *Chapel-street, Park-lane, W.*
- 1873 Weguelin, Thomas Matthias,
44, *Grosvenor-gardens, S.W.*
- 1879 Weir, William,
38, *South Audley-street, W.*
- 1873 *Welby, Sir Reginald Earle, K.C.B.,
The Treasury, Whitehall, S.W.
- 1879 Welch, John Kemp, J.P.,
Clock House, Clapham-common, S.W.
- 1855 Weldon, James Walton,
1, *St. James's-square, S.W.*
- 1873 Wellington, His Grace the Duke of, K.G., &c., &c.,
Apsley House, Piccadilly, W.
- 1873 Wells, W. Lewis,
66, *Old Broad-street, E.C.*
- 1855 Welton, Thomas Abercrombie, (5, *Moorgate-street, E.C.*),
Rectory Grove House, Clapham, S.W.
- 1879 Wenley, James Adams,
Bank of Scotland, Bank-street, Edinburgh.

Year of Election.	
1876	Westgarth, William, 8, <i>Finch-lane, E.C.</i>
1879	*Westlake, John, Q.C., LL.D., <i>The River House, 3, Chelsea Embankment, S.W.</i>
1882	*Whadcoat, J. H., <i>Halifax, Yorkshire.</i>
1883	Whadcoat, William E., <i>Crown Buildings, Old Broad-street, E.C.</i>
1878	Wharton, James, 10, <i>Buckland-crescent, Belsize-park, N.W.</i>
1859	Whitbread, Samuel, M.P., 10, <i>Ennismore-gardens, Princes-gate, S.W.</i>
1876	Whitcher, John, Jr., F.I.A., 81, <i>King William-street, E.C.</i>
1863	White, Leedham, 44, <i>Onslow-gardens, S.W.</i>
1879	White, Robert Owen, J.P., <i>The Priory, Lewisham, S.E.</i>
1871	White, William, 70, <i>Lombard-street, E.C.</i>
1878	Whiteford, William, 3, <i>Temple-gardens, E.C.</i>
1873	Whitehead, Jeffery, 39, <i>Throgmorton-street, E.C.</i>
1879	*Whitwill, Mark, J.P., <i>Redland House, Durdham-park, Bristol.</i>
1878	Wilcox, William, L.R.C.P. (Edin.), M.R.C.S., <i>Holly House, North Walsham, Norfolk.</i>
1875	Wilkinson, Thomas Read, <i>Manchester and Salford Bank, Manchester.</i>
1860	Willans, John Wrigley, <i>Beech Holme, Burley, Leeds.</i>
1879	Williams, Edward, <i>Cleveland Lodge, Middlesborough.</i>
1864	Williams, Frederick Bessant, 2, <i>Ludgate Hill, E.C.</i>
1881	Williams, Henry Maunder, 58, <i>Acre-lane, Brixton, S.W.</i>
1870	Williams, H. R., 3, <i>Lime-street, E.C.</i> ; and <i>Oak Lodge, Highgate, N.</i>
1876	Williams, John Worthey, 5, <i>Marlborough-road, Upper Holloway, N.</i>
1877	WILLIAMS, RICHARD PRICE, C.E., 38, <i>Parliament-street, S.W.</i>
1874	*Wilson, Robert Porter, 5, <i>Cumberland-terrace, Regent's-park, N.W.</i>
1872	*Winch, William R., <i>North Mymms Park, Hatfield, Herts.</i>
1883	Wishwanath Narayan Mandlick, The Hon. Rao Saheb, C.S.I., <i>Legislative Council, Bombay.</i>

Year of Election.	
1868	Wood, H. W. I. (<i>Calcutta</i>), <i>Care of Messrs. Richardson, 13, Pall Mall, S.W.</i>
1883	Wood, Thomas Percival, <i>137. Fenchurch-street, E.C.; and 127, Peckham Rye, S.E.</i>
1877	Woodrow, Thomas John. <i>Sisland Cottage, Wanstead.</i>
1873	Woods, Henry, <i>Warnford Park, Bishop's Waltham, Hants.</i>
1888	Woolhouse, Wesley Stoker Barker. F.R.A.S., <i>Alwyne Lodge, Alwyne-road, Canonbury, N.</i>
1874	Woolner, Thomas, R. A., <i>29, Welbeck-street, Cavendish-square, W.</i>
1878	Worsfold, Rev. J. N., M.A., <i>Haddelsey Rectory, near Selby, Yorkshire.</i>
1880	Wren, Walter, <i>7, Powis-square, W.</i>
1883	Wright, Bryce McMurdo, <i>Hesket House, 54, Guilford-street, Russell-square, W.C.</i>
1838	*Wyatt-Edgell, Rev. Edgell, <i>40, Lower Grosvenor-street, W.; Stanford Hall, Rugby.</i>
1872	Yeatman, Morgan, <i>Shawfield. Bromley, Kent.</i>
1879	Yeats, John, LL.D., <i>7, Beaufort-square, Chepstow.</i>
1877	*Youll, John Gibson, <i>Jesmonds-road, Newcastle-on-Tyne.</i>
1849	*Young, Charles Baring, <i>12, Hyde-park Terrace, W.</i>
1882	Young, E. M., <i>123, Bishopsgate-street Within, E.C.</i>

* * * The Executive Committee request that any inaccuracy in the foregoing list may be pointed out to the ASSISTANT SECRETARY and that all changes of address may be notified to him, so that delay in forwarding communications and the publications of the Society may be avoided.

HONORARY MEMBERS.

HIS ROYAL HIGHNESS THE PRINCE OF WALES, K.G.,

Honorary President.

EUROPE.

*Austria and Hungary.*Year of
Election.

1874. **Budapest**..... M. CHARLES KELETI, Conseiller ministériel ; Chef du Bureau royal hongrois de Statistique.
Docteur en droit ; Chevalier de l'ordre autrichien de Léopold ; Commandeur de l'ordre russe de St. Stanislaus et de l'ordre portugais de la Villa Vicosa.
1877. **Vienna**..... DR. HUGH FRANCIS BRACHELLI, Aulic Councillor, Chief of the Statistical Department, Ministry of Commerce ; Professor at the Technical High School in Vienna ; President of the Permanent Commission for Commercial Values. Commander of the Russian Orders of St. Anna and St. Stanislaus, of the Luxembourg Order of the Oak-Crown ; Officer of the Order of the Italian Crown ; Knight of the Order of the House of Saxe-Ernestine ; Officer of Public Instruction of France, &c., &c.
1851. „ S. E. M. CHARLES BARON DE CZOERNIG, Conseiller intime actuel de S. Majesté Imp. et Royale ; Ancien Président de la Commission Centrale Imp. et Royale de Statistique à Vienne.
1879. „ PROFESSOR FR. XAVIER von NEUMANN-SPALLART, D.C.L., Professor of Political Economy and Statistics, Agricultural College, University of Vienna ; Aulic Councillor ; Member of the Imperial Statistical Commission ; Honorary Member of the Statistical Society of Paris, and of the Cobden Club.
1877. „ M. MAX WIRTH, Ancien Chef du Bureau fédéral de Statistique en Suisse.

Belgium.

1879. **Brussels** M. le DR. EUGÈNE JANSSENS, Docteur en médecine, &c. ; Inspecteur en chef du Service d'Hygiène de la Ville de Bruxelles.
Membre de l'Académie royale de médecine, de la Commission centrale de Statistique, du Conseil Supérieur d'Hygiène, de la Commission médicale locale ; Membre Secrétaire de la Commission locale de Statistique, &c. ; Chevalier de l'ordre de Léopold et de l'ordre de St. Maurice et de St. Lazare, &c.

Denmark.

Year of
Election.

1878. **Copenhagen** .. PROFESSOR VIGAND ANDREAS FALBE-
HANSEN, Professor of the University of Copen-
hagen ; Member of the "Folkething."
1852. ,, .. DR. PETER ANTON SCHLEISNER, Officer of
Health of the City of Copenhagen ; Member of the
Royal General Board of Health for Denmark,
Doctor of Medicine, Conseiller d'État ; Knight of
the Order of Dannebrog, and the Swedish Order
of "Nordstjerne" ; Corresponding Member of the
Medical Society in Stockholm and Christiania, of
the "Société de Médecine publique et d'Hygiène
professionnelle" in Paris, of the "Société d'Hygiène
publique de Bordeaux, and of the "Société royale
de Médecine publique de Belgique," &c.

France.

1880. **Paris**..... M. le DR. JACQUES BERTILLON, Docteur en
médecine ; Chef des Travaux statistiques de la
Ville de Paris : Directeur des "Annales de Démon-
graphie internationale ;" Professeur suppléant à
l'Ecole d'anthropologie.
1856. ,, M. MAURICE BLOCK, Membre de l'Institut de
France (Académie des Sciences morales et politi-
ques) ; Chevalier de la Légion d'honneur et des
ordres de Suède, Russie, Prusse, Bavière, Autriche-
Hongrie, Grèce, Italie, Espagne, Portugal.
1879. ,, M. le DR. ARTHUR CHERVIN, Directeur de
l'Institution des Bègues de Paris ; Docteur en
médecine et en chirurgie ; Membre de la Com-
mission permanente de Statistique de la Ville de
Paris ; Fondateur des "Annales de Démographie
internationale," &c.
1878. ,, M. MAXIMIN DELOCHE, Membre de l'Institut
de France ; Directeur honoraire de la Statistique
Générale de France ; Commandeur de la Légion
d'honneur ; Officier de l'Instruction publique ; Com-
mandeur de l'ordre Imp. et Royale de François
Joseph d'Autriche-Hongrie ; Membre de diverses
Sociétés savantes.
1870. ,, M. CLÉMENT JUGLAR, Président Sortant de la
Société de Statistique de Paris.
1854. ,, M. ALFRED LEGOYT, Ancien Directeur de la
Statistique Générale.
1860. ,, M. PIERRE ÉMILE LEVASSEUR, Membre de
l'Institut de France ; Professeur au Collège de
France et au Conservatoire des arts et métiers.
1860. ,, M. MARIE, LOUIS PIERRE FELIX ESQUIROU
DE PARIEU, Sénateur ; Membre de l'Institut de
France ; Grand croix de la Légion d'honneur, et
de plusieurs ordres étrangers.

Year of
Election.

1876. **Paris** M. LE PRÉSIDENT DE LA SOCIÉTÉ DE STATISTIQUE DE PARIS.
1880. „ L'HONORABLE M. JEAN BAPTISTE LÉON SAY, Sénateur ; Membre de l'Institut de France.

Germany.

1877. **Bavaria** DR. GEORGE MAYR, formerly Director of the Royal Bureau of Statistics ; Ministerialrath and Universitäts Professor.
1860. „ DR. GEORGE KARL LEOPOLD SEUFFERT, Chief Inspector and Director of the Royal Custom House at Simbach ; Knight of the Order of St. Michael.
1878. **Berlin** DR. CHARLES BECKER, Director des Kaiserlichen Statistischen Amts; Geheimer Ober-Regierungsrath.
1854. „ DR. ERNEST ENGEL, formerly Director of the Royal Statistical Bureau of Prussia.
1876. **Frankfort** THE PRESIDENT OF THE STATISTICAL SOCIETY OF FRANKFORT.
1871. **Stuttgart** SIR HENRY PAGE-TURNER BARRON, Bart., British Minister.

Great Britain and Ireland.

1876. **Dublin**..... THE PRESIDENT OF THE STATISTICAL AND SOCIAL INQUIRY SOCIETY OF IRELAND.
1876. **Manchester** .. THE PRESIDENT OF THE MANCHESTER STATISTICAL SOCIETY.

Greece.

1870. **Athens**..... M. A. MANSOLAS, Chef de Division, Directeur du Bureau de Statistique Hellénique.

Italy.

1879. **Genoa** SIGNOR GEROLAMO BOCCARDO, Senatore del Regno ; Professore di Economia nella Regia ; Scuola Superiore Navale, e di Statistica nella R. Università di Genova ; Commendatore dei S.S. Maurizio e Lazzaro ; Grande Ufficiale della Corona d'Italia ; Cavaliere del Merito Civile di Savoia, &c.
1880. **Padua** DR. EMILIO MORPURGO, Deputato al Parlamento ; Professore ordinario di statistica nella regia Università di Padova ; membro del consiglio superiore di statistica ; Membro effettivo del regio Istituto Veneto Socco corrispondente della reale Accademia dei Lincei ; Gr. uff. dell'Ordine della Corona d'Italia ; Comm. dell'Ordine dei S.S. Maurizio e Lazzaro ; Gr. cord. dell'Ordine di Fr. Giuseppe.

- Year of Election.
1880. **Pavia** DR. LUIGI COSSA, LL.D., Professor of Political Economy at the University of Pavia; Honorary Member of the Cobden Club.
1874. **Rome** SIGNOR LUIGI BODIO, Direttore generale della Statistica del Regno; Professore.
1865. „ REV. CESARE CONTINI, Priest and Beneficiario Vaticano; Member of the Statistical Society of Pavia; of the Hygienic Society of Italy; and of the Hygienic Society of Paris.
1877. „ S. E. CESARE CORRENTI, Deputato al Parlamento; Vice-Presidente della Giunta Centrale di Statistica; già Ministro della Pubblica Istruzione.
1880. „ DR. ANGELO MESSEDAGLIA, Deputato al Parlamento; Professore Ordinario di Università; Commendatore.
1868. „ IL MARCHESE ERMENEGILDO DEI CINQUE QUINTILI, Avvocato, Segretario Generale della Commissione degli Ospedali di Roma.
1854. **Turin**..... SIGNOR GIOVANNI FLECHIA, Professore di Storia comparata delle lingue classiche e neolatine, e di sanscrito nell'Università di Torino; Commendatore; della R. Accademia delle Scienze di Torino e di quella de i Lincei; dell'ordine del Merito Civile di Savoia.
1845. **Venice**..... SIGNOR FRANCESCO FERRARA, Professore e Direttore della Scuola Superiore di Commercio a Venezia; già Deputato al Parlamento; già Ministro delle Finanze.

Portugal.

1854. **Lisbon**..... M. A. J. D'AVILA, Ministre d'État honoraire, Conseiller d'État, et Député des Cortès.

Russia.

1873. **St. Petersburg** HIS EXCELLENCY M. PETER SEMENOFF (SEMENOW), Senator, Conseiller privé de S.M.I. President of the Statistical Council; President of the Imperial Geographical Society; Honorary Member of the Academy of Sciences in St. Petersburg.
1858. „ M. le DR. J.B. VERNADSKI, Conseiller d'État actuel, ex-Professeur.
1877. „ M. A. VESSÉLOVSKY, Secrétaire du Comité Scientifique du Ministère Impérial des Finances.

Spain.

1845. **Madrid**..... EXMO SEÑOR D. JOSÉ MAGÁZ Y JAYME, Lawyer, and Member of the Council of State; Grand Cross of Isabella Catolica; Commander of the Order of Carlos 3º; Ex-Deputy of the Cortes; Ex-Senator; Ex-Director-General of Treasury; Ex-Under-Secretary of the Ministry of Finance, &c.

Sweden and Norway.

Year of
Election.

1858. **Christiania**... PROFESSOR THORKIL HALVORSEN ASCHE-HOÛG, Professor at the University of Christiania; Professor of Law and Political Economy at the University of Christiania; Chairman of the Board of Directors of the Royal Norwegian Hypottukbank; Member of the Institute of International Law, and of the Academies of Christiania, Trondhjem and Upsala, and of the Royal Historical Society of Denmark; Commander of the Norwegian Order of St. Olave; of the Swedish Order of the North Star; and Commander of the First Class of the Order of Danebrog.
1874. ,, .. M. A. N. KICER, Director of the Statistical Bureau of Norway.
1860. ,, THOMAS MICHELL, Esq., C.B., H.B.M. Consul-General in Norway.
1860. **Stockholm**... M. FREDRIK THEODOR BERG, Ancien Directeur du Bureau Royal de Statistique de la Suède; Docteur en médecine; Dr. honoraire en philosophie et en jurisprudence; Membre de l'Académie Royale des Sciences à Stockholm, et de l'Académie Royale de l'Agriculture; Membre correspondant de la Commission centrale de Statistique à Bruxelles, de la Société de Statistique à Paris; Membre des Sociétés des médecins à Stockholm, Christiania, Copenhague et Helsingfors, &c.; Commandeur des Ordres Royales de l'Étoile polaire et de Wasa, &c.

Switzerland.

1840. **Geneva**..... M. MALLET.

Turkey.

1877. **Constantinople**. HIS HIGHNESS AHMED VÉFYK PACHA, Grand Vizir, Sénateur, &c.

AMERICA.

Dominion of Canada.

1876. **Ottawa**..... JOHN LANGTON, Esq., M.A., late Auditor-General.

United States.

1873. **Albany, N.Y.** .. THE HON. WILLIAM BARNES, Councillor-at-Law; Ex-Superintendent of the Insurance Department, State of New York.
1860. **Dorchester, Mass.** DR. EDWARD JARVIS, A.M., late President of the American Statistical Association, Boston.

Year of
Election.

1876. **New Haven, Conn.** FRANCIS A. WALKER, Esq., Ph.D., LL.D., President of the Massachusetts Institute of Technology; Member of the National Academy of Sciences; President of the American Statistical Society.
1870. **Norwich, Conn.** THE HON. DAVID A. WELLS, D.C.L., LL.D., Late Special Commissioner of Revenue of the United States; Chairman of Commission for the Revision of Taxes of the State of New York; President of the American Social Science Association; Member of the Board of Arbitration of American Railways; Corresponding Member of the Institute of France; President of the American Free Trade League; Chairman 1883 of the Department of Finance of the American Social Science Association.
1870. **Taunton, Mass.** THE HON. JOHN ELIOT SANFORD, Lawyer; Speaker of the House of Representatives; Insurance Commissioner; Chairman of the Board of Harbour and Land Commissioners.
1880. **Washington ..** THE HON. CHARLES F. CONANT, late Assistant Secretary of the Treasury of the United States.
1881. ,, JOHN S. BILLINGS, Esq., M.D., Surgeon United States Army; Member of the National Academy of Science, &c.
1877. ,, EDWARD YOUNG, Esq., A.M., Ph.D., formerly Chief of the Bureau of Statistics, United States of America.

AUSTRALASIA.

New South Wales.

1876. **Sydney.....** EDWARD GRANT WARD, Esq., Registrar-General, and a Magistrate of the Colony of New South Wales.

New Zealand.

1876. **Wellington....** JAMES HECTOR, Esq., M.D., C.M.G., F.R.S., L. and E., F.G.S., &c. Director of the Geological Survey, of the Meteorological Department, and of the New Zealand Institute.

Queensland.

1877. **Brisbane.....** HENRY JORDAN, Esq., Registrar General.

South Australia.

1869. **Adelaide** JOSIAH BOOTHBY, Esq., C.M.G., Under Secretary and Government Statist of South Australia.

Tasmania.

Year of

Election.

1876. **Hobart** EDWIN CRADOCK NOWELL, Esq., J.P., Clerk
of Executive and Legislative Councils, and late
Government Statistician.

Victoria.

1875. **Melbourne** HENRY HEYLYN HAYTER, Esq., C.M.G.,
Government Statist of Victoria. Officier de l'In-
struction Publique (France) ; Honorary Member of
the Statistical and Social Inquiry Society of Ireland,
of the Statistical Association of Tokio, and of the
Royal Society of Tasmania ; Honorary Corres-
ponding Member of the Statistical Society of Man-
chester, of the Geographical Society of Bremen,
and of the Royal Society of South Australia ;
Fellow and Honorary Corresponding Secretary for
Victoria of the Royal Colonial Institute.
1858. ,, WILLIAM HENRY ARCHER, Esq., K.S.G.,
F.I.A., F.L.S., &c., Barrister-at-Law.

NOTE.—The Executive Committee request that any inaccuracies in the foregoing List of HONORARY MEMBERS may be pointed out, and that all changes of address may be notified to the Secretary, so that delay in forwarding communications and the publications of the Society may be avoided.

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6. Do. on Admission may attach F.S.S. to their Names.
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RULES OF THE STATISTICAL SOCIETY.

Objects of the Society.

1. THE Statistical Society was established to collect, arrange, digest, and publish facts illustrating the condition and prospects of society, in its material, social and moral relations. These facts are for the most part arranged in tabular forms, and in accordance with the principles of the numerical method.

The Society not only collects new materials, but condenses, arranges, and publishes those already existing, whether unpublished or published in diffuse and expensive forms, in the English or in any foreign language.

The Society likewise promotes the discussion of legislative and other public measures from the statistical point of view. These discussions form portions of the Transactions of the Society.

Constitution of the Society.

2. The Society consists of Fellows and Honorary Members, elected in the manner laid down in the following rules.

Number of Fellows and Honorary Members.

3. The number of Fellows shall be unlimited. Foreigners or British subjects of distinction residing abroad may be admitted as Honorary Members: of whom the number shall not be more than seventy at any one time.

Proposal of Fellows.

4. Every Candidate for admission as a Fellow of the Society, shall be proposed by two or more Fellows, who, shall certify from their personal knowledge of him or of his works, that he is a fit person to be admitted a Fellow of the Statistical Society. Every such certificate having been read and approved at a Meeting of the Council, shall be suspended in the meeting-room of the Society until the following Ordinary Meeting, at which the vote shall be taken upon it.

Election of Fellows.

5. In the election of Fellows, the votes shall be taken by ballot. No person shall be admitted unless at least sixteen Fellows vote, and unless he have in his favour three-fourths of the Fellows voting.

Admission of Fellows.

6. Every Fellow elect shall appear for his admission on or before the third Ordinary Meeting of the Society after his election, or within such time as shall be granted by the Council.

The manner of admission shall be thus:—

Immediately after the reading of the minutes, the Fellow elect, having first paid his subscription for the current year or his composition, shall sign the obligation contained in the Fellowship-book, to the effect following:—

“ We, who have underwritten our names, do hereby undertake, each for himself, that we will endeavour to further the good of the Statistical Society for improving Statistical Knowledge, and the ends for which the same has been founded; that we will be present at the Meetings of the Society as often as conveniently we can, and that we will keep and fulfil the Rules and Orders of this Society: provided that whensoever any one of us shall make known, by writing under his hand, to the President for the time being, that he desires to withdraw from the Society, he shall be free thenceforward from this obligation.”

Whereon the President, taking him by the hand, shall say,—“ *By the authority and in the name of the Statistical Society I do admit you a Fellow thereof.*”

Upon their admission Fellows shall have the right of attaching to their names the letters F.S.S.

Admission of Honorary Members.

7. There shall be Two Meetings in the year, on such days as shall be hereafter fixed by the Council, at which *Honorary Members* may be elected.

No Honorary Member can be recommended for election but by the Council. Any Member of the Council may propose a Foreigner or British subject of distinction residing abroad at any Meeting of the Council, delivering at the same time a written statement of the qualifications, offices held by, and published works of the person proposed; and ten days' notice at least shall be given to every Member of the Council, of the day on which the Council will vote by ballot on the question whether they will recommend the person proposed. No such recommendation to the Society shall be adopted unless at least three-fourths of the votes are in favour thereof.

Notice of the recommendation shall be given from the chair at the Meeting of the Society next preceding that at which the vote shall be taken thereon. No person shall be elected an Honorary Member unless sixteen Fellows vote and three-fourths of the Fellows voting be in his favour.

The Council shall have power to elect as Honorary Members, the Presidents for the time being of the Statistical Societies of Dublin, Manchester, and Paris, and the President of any other Statistical Society at home or abroad.

Payments by Fellows.

8. Every Fellow of the Society shall pay a yearly subscription of *Two Guineas*, or may at any time compound for his future yearly payments by paying at once the sum of Twenty Guineas.*

Defaulters.—Withdrawal of Fellows.

9. All yearly payments are due in advance on the 1st of January, and if any Fellow of the Society have not paid his subscription before the 1st of July, he shall be applied to in writing by the Secretaries, and if the same be not paid before the 1st of January of the second year, a written application shall again

be made by the Secretaries, and the Fellow in arrear shall cease to receive the Society's publications, and shall not be entitled to any of the privileges of the Society until such arrears are paid; and if the subscription be not discharged before the 1st of February of the second year, the name of the Fellow thus in arrear shall be exhibited as a defaulter on a card suspended in the meeting-rooms; and if, at the next Anniversary Meeting, the amount still remain unpaid, the defaulter shall be announced to be no longer a Fellow of the Society, the reason for the same being at the same time assigned. No Fellow of the Society can withdraw his name from the Society's books, unless all arrears be paid; and no resignation will be deemed valid unless a written notice thereof be communicated to the Secretaries. No Fellow shall be entitled to vote at any Meeting of the Society until he shall have paid his subscription for the current year.

Expulsion of Fellows.

10. If any Fellow of the Society, or any Honorary Member, shall so demean himself that it would be for the dishonour of the Society that he longer continue to be a Fellow or Member thereof, the Council shall take the matter into consideration; and if the majority of the Members of the Council present at some Meeting (of which and of the matter in hand such Fellow or Member, and every Member of the Council, shall have due notice) shall decide by ballot to recommend that such Fellow or Member be expelled from the Society, the President shall at the next Ordinary Meeting announce to the Society the recommendation of the Council, and at the following Meeting the question shall be decided by ballot, and if at least three-fourths of the number voting are in favour of the expulsion, the President shall forthwith cancel the name in the Fellowship-book, and shall say,—

“By the authority and in the name of the Statistical Society, I do declare that A. B. (naming him) is no longer a Fellow (or Honorary Member) thereof.”

* Cheques should be made payable to “The Statistical Society,” and crossed “Messrs Drummond and Co.”

And such Fellow or Honorary Member, shall thereupon cease to be of the Society.

Trustees.

11. The property of the Society shall be vested in *three Trustees*, chosen by the Fellows. The Trustees are eligible to any other offices in the Society.

President, Council, and Officers.

12. The Council shall, independent of the Honorary Vice-Presidents, consist of thirty-one Members, of whom one shall be the President, and four be nominated Vice-Presidents. The Council shall be elected as hereafter provided. Any five of the Council shall be a quorum. From the Council shall be chosen a *Treasurer*, *three Secretaries*, and a *Foreign Secretary*, who may be one of the Secretaries. Six Fellows, at least, who were not of the Council of the previous year, shall be annually elected.

Election of President and Officers.

13. The President shall be chosen yearly by the Fellows. The same person shall not be eligible more than two years in succession.

The former Presidents who are continuing Fellows of the Society shall be Honorary Vice-Presidents; four Vice-Presidents shall be yearly chosen from the Council by the President.

Any Honorary Vice-President may take part in the deliberations of the Council on expressing a wish to that effect: and when attending the Meetings of the Council, shall exercise all the rights and powers of a Member of the Council.

The Treasurer and Secretaries shall be chosen yearly by the Fellows from the Council.

Election of Council.

14. The Council shall, previously to the Anniversary Meeting, nominate, by ballot, the *Fellows whom they recommend* to be the next President and Council of the Society. They shall also recommend for election a Treasurer and Secretaries (in accordance with Rule 12). Notice shall be sent to every Fellow whose residence is known to be within the limits of the metropolitan post, at least a fortnight before the

Anniversary Meeting, of the names of Fellows recommended by the Council.

Extraordinary Vacancies.

15. On any *extraordinary vacancy* of the Office of the President, or other Officer of the Society, or in the Council, the Secretaries shall summon the Council with as little delay as possible, and a majority of the Council, thereupon meeting in their usual place, shall, by ballot, and by a majority of those present, choose a new President, or other Officer of the Society, or Member of the Council, to be so until the next Anniversary Meeting.

Committees.

16. The Council shall have power to appoint *Committees of Fellows* and also an Executive Committee of their own body. The Committees shall report their proceedings to the Council. No report shall be communicated to the Society which is not approved by the Council.

Meetings Ordinary and Anniversary.

17. The *Ordinary Meetings* of the Society shall be monthly, or oftener, during the Session, which shall be from the 1st of November to the 1st of July, both inclusive, on such days and at such hours as the Council shall declare. The *Anniversary Meeting* shall be held on such day in June of each year as shall be appointed by the Council for the time being.

Business of Ordinary Meetings.

18. The business of the *Ordinary Meetings* shall be to admit Fellows, to read and hear reports, letters, and papers on subjects interesting to the Society. Nothing relating to the rules or management of the Society shall be discussed at the Ordinary Meetings, except that the *Auditors' Report* shall be received at the Ordinary Meeting in *February*, and that the Minutes of the Anniversary Meeting, and of every Special General Meeting, shall be confirmed at the next Ordinary Meeting after the day of such Anniversary or Special General Meeting. *Strangers* may be introduced to the Ordinary

Meetings, by any Fellow, with the leave of the President, Vice-President, or other Fellow presiding at the Meeting.

Business of Anniversary Meeting.

19. The business of the *Anniversary Meeting* shall be to elect the Officers of the Society, and to discuss questions on its rules and management. No Fellows or Honorary Members shall be proposed or admitted at the Anniversary Meeting. No Fellow shall moot any question on the rules or management of the Society at the Anniversary Meeting, unless after *three weeks' notice* thereof given to the Council, but amendments to any motion may be brought forward without notice, so that they relate to the same subject of motion. The Council shall give fourteen days' notice to every Fellow of all questions of which such notice shall have been given to them.

Special General Meetings.

20. The Council may, at any time, call a *Special General Meeting* of the Society when it appears to them necessary. Any ten Fellows may require a Special General Meeting to be called, by notice in writing signed by them, delivered to one of the Secretaries at an Ordinary Meeting, specifying the questions to be moved. The Council shall, within one week of such notice, appoint a day for such Special General Meeting, and shall give one week's notice of every Special General Meeting, and of the questions to be moved, to every Fellow within the limits of the metropolitan post, whose residence is known. No business shall be brought forward at any Special General Meeting other than that specified in the notice for the same.

Auditors.

21. At the *first Ordinary Meeting* of each year, the Fellows shall choose two *Auditors*, not of the Council, who, with one of the Council, chosen by the Council, shall audit the Treasurer's accounts, and report thereon to the Society, which report shall be presented at the Ordinary Meeting in February. The Auditors shall be empowered to examine into the particulars of all expenditure of the funds of the Society

where they shall see occasion, and may report their opinion upon any part of it.

Duties of the President.

22. The *President* shall preside at all Meetings of the Society, Council, and Committees, which he shall attend, and in case of an equality of votes, shall have a second or casting vote. He shall sign all diplomas of admission of Honorary Members. He shall admit and expel Fellows and Honorary Members, according to the rules of the Society.

Duties of the Treasurer.

23. The *Treasurer* shall receive all moneys due to, and pay all moneys due from, the Society, and shall keep an account of his receipts and payments. No sum exceeding Ten Pounds shall be paid but by order of the Council, excepting always any lawful demand for rates or taxes. He shall invest the moneys of the Society in such manner as the Council shall from time to time direct.

Duties of the Secretaries.

24. The *Secretaries* shall, under the control of the Council, conduct the correspondence of the Society; they or one of them shall attend all Meetings of the Society and Council, and shall have the care of duly recording the Minutes of the Proceedings. They shall issue the requisite notices, and read such papers to the Society as the Council may direct.

Powers of the Vice-Presidents.

25. A *Vice-President*, whether Honorary or nominated, in the chair, shall act with the power of the President, in presiding and voting at any Meeting of the Society or Council, and in admitting Fellows; but no Vice-President shall be empowered to sign diplomas of admission of Honorary Members, or to expel Fellows. In the absence of the President and Vice-Presidents, any Fellow of the Society may be called upon, by the Fellows then present, to preside at an Ordinary Meeting. The Fellow so presiding may admit Fellows, but shall not be empowered to act otherwise as President, or Vice-President.

Powers of the Council.

26. The Council shall have control over the papers and funds of the Society, and may, as they shall see fit, direct the publication of papers and the expenditure of the funds, so, that they shall not at any time contract engagements on the part of the Society beyond the amount of the balance that would be at that time in the Treasurer's hands, if all pre-existing debts and liabilities had been satisfied.

27. The Council shall be empowered at any time to frame *Regulations* not inconsistent with these rules, which shall be, and remain in force until the next Anniversary Meeting at which they shall be either affirmed or annulled; but no Council shall have power to renew Regulations which have once

been disapproved at an Anniversary Meeting.

28. No Dividend, Gift, Division, of Bonus in money shall be made by the Society, unto or between any of the Fellows or Members, except as herein-after provided.

29. The Council shall publish a Journal of the Transactions of the Society, and such other Statistical Publications, as they may determine upon, and may from time to time pay such sums to Editors and their assistants, whether Fellows of the Society or not, as may be deemed advisable.

30. All communications to the Society are the property of the Society, unless the Council allow the right of property to be specially reserved by the Contributors.

REGULATIONS OF THE LIBRARY.

1. The Library is open daily from 10 a.m. till 5 p.m., except on Saturdays, when it closes at 2 p.m.; and it is entirely closed during the month of September.

2. Members of the Society are permitted to take out Books on making personal application, or by letter addressed to the Librarian.

3. Members are not to have more than two works at a time, nor keep any books longer than a month.

4. Scientific Journals and Periodicals are not circulated until the volumes are completed and bound.

5. Cyclopædias and works of reference are not circulated.

6. Any Member damaging a book, either replaces the work, or pays a fine equivalent to its value.

7. Books taken from the shelves for reference, are *not* to be replaced, but must be laid on the Library table.

8. The Secretary shall report to the Council any infringement of these regulations.

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„ Customs.	„ „ „ Ireland.
„ Factories, Inspectors of.	„ „ „ Scotland.
„ Fire Brigade, Metropolitan.	„ Warden of Standards.
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 Actuaries, The Institute of.
 Adelaide, Philosophical Society of.
 Agriculture, Central Chamber of.
 Allan, Nathan, Esq.
 Allen, Messrs. W. H. & Co., London.
 Allen, Joseph, Esq.

American—
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 Boston.
 Academy of Natural Sciences,
 Philadelphia.
 Geographical Society of N. York
 Philosophical Soc. of Philadelphia.
 Amici, F. Bey, Cairo, Egypt.

During the Year 1883—Continued.

Arts, Society of.

Asiatic Society of Bengal.

„ „ Japan.

Astor Library, New York U. S. A.

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Austrian Statistical Commission.

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Baines, J. A., Esq.

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„ Magazine, London.

„ „ New York.

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Behm, G., Esq.

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„ The Statistical Bureau.

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Böckh, Herr, Berlin.

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„ Iron Trade Association.

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Budapest, Chamber of Commerce.

Budapest, Statistical Bureau.

Buenos Ayres, Statistical Bureau of.

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Canada, Geological Survey of.

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Day, S., Esq.

Denmark, Statistical Bureau of.

„ Political Economy Soc.

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Economiste Français, The Editor of.

Edinburgh, The City Chamberlain.

„ Royal Society of.

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Ellison & Co., Messrs., Liverpool.

Fairland, W., Esq., York.

Finance Chronicle, The Editor of.

Flax Supply Association, Belfast.

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Foville, M. A. de, Paris.

During the Year 1883—Continued.

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 " Permanent League for the
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 Historic Society of Lanc. & Cheshire.
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 Hungary, Statistical Bureau of.

 India, The Government of.
 Insurance Gazette, The Editor of.
 " Record, The Editor of.
 Investors' Monthly Manual, The.
 Iron and Coal Trades' Review, The.
 Iron and Steel Institute.
 Italy, Director General of Statistics.

 Jamaica, The Registrar-General.
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 Labourers' Friend, The Editor of.
 Labouring Classes, Society for Im-
 proving the Condition of the.
 Land, The Editor of.
 Lee, Lionel, Esq., Ceylon.
 Levasseur, M. E., Paris.
 Lisbon, Geographical Society of.
 Littledale, Ragg, & Co., Messrs.
 Liverpool, Lit. and Phil. Society.
 Local Taxation Committee.
 London Chamber of Commerce.
 London Hospital, The Secretary.
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 Lucas, Franz Karl, Esq.
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 Machinery Market, Editor of.
 Macmillan and Co., Messrs., London.

*During the Year 1883—Continued.**Madrid—*

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 Statistical Society of.
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 Nature, The Editor of, London.

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Reims, Bureau of Hygiene.

Review, The Editor of.

Revista Topográfica y Estadística.
 The Editor of.

Révue Bibliographique Universelle,
 The Editor of, Paris.

Révue Géographique Internationale,
 The Editor of, Paris.

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 Registrar of.

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„ Asiatic Society.

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„ Geographical Society.

„ Irish Academy.

„ Med. and Chirurgical Society.

„ Society.

„ United Service Institution.

Russia, Department of Agriculture.

„ Imp. Geographical Society.

During the Year 1883—Continued.

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 Sanitary Record, The Editor of.
 Saxony, Royal Statistical Bureau.
 Scott, Benjamin, Esq.
 Seaton, The Hon. C. B., Boston.
 Shaw, Capt. E. M., C.B., London.
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 Society of Ireland.
 Stock Exchange, London.
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 Sutton, C. W., Esq.
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 Switzerland, Statistical Bureau.
 Tasmania, The Government Statist.
 " The Registrar-General of
 " Royal Society of.
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 Thompson, Messrs. W. J. & H.
 Trübner and Co., Messrs., London.

United States—

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 Bureau of Education.
 Bureau of Immigration & Mining
 Intelligence.

United States—continued.

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 Department of State.
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 Surgeon - General, Marine Hos-
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 University College, London.
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By a resolution of the Council, dated 12th May, 1854, the price of back numbers of the *Journal* of the Society, charged to Members, was raised from one-half to three-fifths of the publishing price.

NOTE.—One or two numbers of the *Journal* are now out of print.

STATISTICAL SOCIETY'S LIBRARY.

The following is a List of some of the Odd Numbers, Parts, and Volumes, of Works wanting in the Library.

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[Dates and Numbers in all cases are inclusive.]

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- Annuaire Statistique de la Belgique. 1^{er} an (1870).
 „ de l'Observatoire de Bruxelles. 1833-54, 1856-64,
 1874, *et seq.*
 Observations de la Cour des Comptes. Part for 1832.
 Bulletin de la Commission Centrale de Statistique. Vols. v—viii.
 Documents Statistiques, &c. Tome xiv (1870), *et seq.*
 Statistique Générale de la Belgique. Exposé de la Situation du
 Royaume. 1831-40; 1841-50.
 Bulletin Hebdomadaire de Statistique Démographique et Medi-
 cale de la Ville de Bruxelles.
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JOURNAL OF THE STATISTICAL SOCIETY,

MARCH, 1883.

STATISTICS of AGRICULTURAL PRODUCTION.

By MAJOR P. G. CRAIGIE, *Secretary of the Central Chamber of Agriculture.*

[Read before the Statistical Society, 16th January, 1883. The PRESIDENT in the Chair.]

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NEVER in the memory of the present generation has so much interest and attention been directed to agricultural questions as at the present time. A prolonged series of disastrous seasons, acting in unwonted combination with reduced prices received by the cultivators of the soil for the deteriorated remnant of the produce, has over a large surface of the country rendered the business of the agriculturist a wholly unprofitable one. Widespread ruin to many individuals, heavy losses of agricultural capital, a largely diminished income to the classes directly concerned in the ownership or occupation of the land, and as a necessary result a material check to the prosperity of the nation, arising from the partial paralysis of a fundamental industry, have led nearly every man among us to ponder over the true meaning and possible lessons of the distressful fact which, for want of a better term, we call agricultural depression.

At such a crisis the statistical inquirer has not been idle. The columns of the ordinary newspapers of the day, the pages of our parliamentary literature, and the quarterly journals of this Society, have for the last year or two borne undoubted testimony to the general search after figures explanatory of the situation. It may

be asked, therefore, why do I recall the attention of the Society to a matter already dealt with by far abler hands, and why do I add what may seem yet another postscript to an oft-told tale? My answer is a simple one. The very multitude of the explanations offered, the varied nature of the statistics tendered us, and the widely diverse and sometimes conflicting character of the prescriptions offered, or at least consolations proposed to us, all conspire to invite more attention to a very old subject, and make me ask whether it may not be profitable for us to re-open a very old controversy; whether in fact we may not now succeed in obtaining, what has often been recommended in days of agricultural prosperity, a complete official record of our yearly fluctuating agricultural position. Could this be done, and could we agree on an accepted standard of normal agricultural production, we should be able alike in days of progress, and in times of disaster and retrogression, to measure with some certainty whether on the whole we are going forward or going back.

I do not forget that we stand to-day statistically in a vastly better position than we did twenty years ago. Not this Society only, but the country owes to our late President, Sir James Caird, and to those who worked with him in the cause of agricultural statistics, a debt of gratitude in procuring the collection by the State of the fundamental data for any agricultural inquiry. This we have in the annual volume now issued by the department represented by our present President. Information of the utmost value is here supplied, both as to the yearly acreage of our crops, and the numbers of our live stock on a given day and in certain given areas, coupled also in recent years with very opportune statistics of the growing volume of our food imports, presenting as these do a graphic picture of the failure of home produce to feed our population.

If the estimates and calculations as to the extent of our present agricultural disaster are even now somewhat contradictory what would have been the Babel of conjectures and explanations which would have perplexed and puzzled us, had statistically minded inquirers into agricultural depression in 1879 or 1882 no better charts to guide them than were possessed by the public before the institution of the Board of Trade Agricultural Returns in 1866? Guesses there were many at our probable acreage of corn crops before the facts were ascertained, but they were guesses at the best. Although the State did nothing in these days to help a solution, valuable unofficial efforts were no doubt made by means of more or less elaborate personal inquiries; and the labours of Mr. McCulloch and Mr. Caird deserve recognition for the remarkable approach of their estimates to the subsequently ascertained

facts. Still if we reflect on the double sources of error which must have arisen in any effort to discover our actual or relative production, when we should have had to employ a hypothetical basis of area as well as a hypothetical yield of crops, it must be apparent that a large and material step has been gained. Is it then not possible to take one step more, and gather in England information as to the produce of our soil as well as to the mode in which that soil is occupied?

I use the term "England" advisedly, for it must not be forgotten that in Ireland such an official record has long been annually compiled. It was disaster, I believe, that prompted the effort there. Perhaps the same result may follow disaster on this side of St. George's Channel. More than ten years also before official statistics of any sort were collected here, and while many English farmers were timidly resisting the very idea of inquiry, the Highland and Agricultural Society of Scotland, with the ready aid of practical agriculturists, gathered for the Board of Trade a valuable series of facts for some years in Scotland, embracing elaborate data as to the yield and character as well as the distribution of the several crops. Such data is forthcoming now in almost all civilised empires, and forms a recognised and useful branch of their domestic statistics. The Statistical Office of the United States Department of Agriculture gives ungrudgingly not merely annual but monthly reports, of the greatest value to their own community, and even to ourselves, since the agricultural growth of America is a matter in which Englishmen in these days, whether as farmers or as consumers, have a keen and immediate interest. If we turn to our continental neighbours, or to the records of our own colonies, we shall see that what the English public seem to think nothing of, and what the English agriculturist in too many instances, I fear, still regards as useless or objectionable, the natives of other lands deem vital and essential.

The Royal Commission.

Before inquiring how such data is got in other countries, or how it has been proposed we should get it here, I cannot but interpose an expression of regret that a recent most opportune occasion which presented itself has not been made full use of. The position and prospects of British agriculture has just been the subject of a long, laborious, and costly inquiry. This inquiry, I believe, was most properly undertaken. It is one from which, differing from some of my friends in this respect, I expect no small amount of ultimate good. But although three long years have been spent in this inquiry, we cannot help observing that the final report bears many traces of haste, possesses no very symmetrical

arrangement, and is certainly statistically defective and incomplete. Nevertheless this Commission has enriched the agricultural literature of the day with a library of valuable blue books, offering to the agricultural economist of the present, and the agricultural historian of the future, a perfect mine of information brought together from the voluminous evidence of an immense selection of experts of all classes, and the researches of able and indefatigable assistant commissioners, conducted within the United Kingdom itself, on the continent of Europe, and on that great western continent which throughout the present depression has been the occasion of so much alarm to the agricultural classes of England.

Vast as are the stores of information thus collected, and made available for all who have time and patience to win the treasure from the mine in which it lies buried, I cannot but think that the Commission has omitted one very important function which it might fairly have been expected to discharge. It has reported indeed in general terms as to the great causes, climatic and economic, of agricultural depression. Whilst acknowledging the narrow margin within which legislation can help the farmer, it has indeed shadowed out within this margin some ten or twelve specific legislative changes which the Commissioners rightly urge on the attention of Parliament at this crisis. But though the Commission briefly quotes to us the calculations as to actual losses laid before it by certain eminent authorities, or narrated by individual farmers, it has not itself made use of these data, or of the mass of individual evidence before it, to venture on any official estimate of the extent of the direct losses of agriculturists, or the consequent and indirect, but no less real, losses of the country as a whole. It has not availed itself of the machinery it possessed, and the important local inquiries it conducted, to give us a standard of the normal limits of British agricultural production, whereby we might measure what was in happier times the average yearly outturn of this vast industry, and in what specific particulars the earth has ceased to yield her accustomed increase. Surely the mass of evidence collected throughout England by the assistants of the Commission, or extracted from its witnesses, might have been made to yield a more fully developed crop of agricultural statistics, and especially of statistics of agricultural production, than have ever before been in the hands of the British public.

The failure of the most laborious inquiry ever made into British agriculture, embracing a specially conducted series of local inquiries by well qualified experts, to furnish what statisticians have long been asking for, is undoubtedly disappointing. I cannot but feel a good opportunity has been missed, and we are launched on a probable series of political discussions upon agricultural ques-

tions, without the aid of any authoritative and accepted estimates. While therefore we have estimates of various sorts volunteered as to sections of our own consumption of food, and of our agricultural produce, or even as to the aggregate outturn of British acres, we have no official ones, and I feel sure those who have in the dark directed their efforts to frame calculations, will be the first to acknowledge much remains to be done. I personally have little right to trouble you with such a question, but I think I am not wrong in claiming for the matter the serious consideration of this Society; and were authority needed to enforce the subject on our consideration, I would remind you of the wise councils of a late President, Mr. Newmarch, whose loss is still so keenly felt, who, in his address in 1869, urged on the younger members of the Statistical Society as the first of the fields of research requiring most early consideration, the aggregate consumption per head among different classes, and by the nation as a whole, of the chief articles of food, corn, butcher's meat, and other produce; and as the second, the annual production of our agriculture, adding, in words which I do not think at all inappropriate even now, "At present we cannot speak with any approach to accuracy of the extent and cost of the most vital of all requirements, the food of the people; we are perpetually guessing at the probable consumption of wheat and other grains per head, and the same of potatoes and butcher's meat."

By way then of urging others who have more ability and time to go more fully into the matter than I can pretend to do, I would ask leave to put, I fear somewhat crudely, before you what has been attempted in this country by unofficial efforts, what I have been able to glean from the occasional statistics compiled during the present inquiry by the assistants to the Duke of Richmond's Commission, and what is officially done abroad, while I will try to bring together, so far as may be, the various efforts of independent investigation both as to the details and the aggregate of our agricultural production.

Early Attempts at Statistics.

The curious vagueness of our English ideas as to the dimensions and the use of the soil we live on, a vagueness which still obtains far too much throughout the whole range of agricultural questions, was perhaps never more visible than when Mr. Pitt, in his estimate for his income tax assumed the acreage of England and Wales to be, as Arthur Young, mistakenly, imagined, a matter of close upon 47 million acres, when it was only some 37 millions.

Without going needlessly far back, I find in parliamentary records as early as 1827 an approach to closer agricultural statistics,

limited indeed to general figures, and representing acreage only, but perhaps worth reproduction, that we may contrast them with the official figures now available. This estimate of Mr. William Couling, as laid before a parliamentary committee on emigration, and by them printed in their report, would, if we are to attach any value to Mr. Couling's labours, endorse the impression that the extension of pasture and reduction of arable land in England, the feature we hear most of in agricultural statistics to-day, is but the reversal of a process begun at no remote period, and a return to an older state of matters.

Of course this estimate may have been founded on imperfect data, but we are told it was the result of personal researches conducted both between 1796 and 1816, and again in 1824-27, involving journeys of over 50,000 miles in 106 counties of the United Kingdom. Mr. Couling's table, which had special reference to that gentleman's estimate of the land which might be and yet was not under crops, may be given in thousands of acres as follows:—

	Arable and Garden Land.	Pasture and Meadow.	Wastes.		Total.
			Reclaimable.	Unre- claimable.	
England	10,253	15,379	3,454	3,256	32,362
Wales	891	2,226	530	1,105	4,752
Scotland	2,494	2,770	5,950	8,524	19,738
Great Britain	13,638	20,375	9,934	12,885	56,832
Ireland	5,389	6,736	4,900	2,417	19,442
Islands	110	276	166	569	1,119
United Kingdom	19,137	27,385	15,000	15,871	77,393

We need not be required to endorse Mr. Couling's sanguine estimate of 15 million acres of wastes capable of profitable reclamation. The course of agriculture in the fifty-six years since this table was drawn, first under protection and then under free trade, has never been such as to tempt sanguine speculators into the suggested addition of 33 per cent. to the "cultivated area" of the United Kingdom. I leave others to place what value they please on the figures here quoted, only calling attention to the proportion of grass to arable land, the latter forming less than 41 per cent. of the cultivated area seventy years ago against 47 per cent. now, while there is a close coincidence between the total of $46\frac{1}{2}$ millions of cultivated land accounted for by Mr. Couling and the $47\frac{1}{2}$ millions of Mr. Giffen's present statistics.

The attempt of the magistrates of Norfolk in 1831 to obtain agricultural statistics for their own county should be noticed as a

matter of history, if only for the fact that even in those days 429 persons, out of 680 applied to, returned the information sought. A later attempt made by the Board of Trade to obtain experimentally a set of agricultural statistics for the single county of Bedford, through the instrumentality of the clergy, failed, only 27 out of 126 parishes being accounted for; the data rendered, however, as may be seen from the tables printed at the time in the *Journal* of this Society, were in these cases very complete, and embrace as well as acreage, the gross produce and yield per acre of every crop, and the relative size of the farms, the class of soil, and even the prevailing mode of tenure.

Again, in 1845, in England, Scotland, and Ireland, a partial attempt was made. North Hampshire was the English place of experiment; Midlothian the Scottish; and Bailieborough Union, the Irish. The last, conducted by private agency, was entirely successful. The second was equally satisfactory, the agency of the parochial schoolmasters being employed. The English effort, by means of the boards of guardians, failed. Compulsory statistics were, one year after, projected by a Government Bill brought in by Mr. Milner Gibson, but like some later measures, not proceeded with. Ireland, however, warned by disaster, established her fairly complete series of agricultural statistics, which are still collected by the Registrar-General's Department, through the agency of the constabulary, who are aided in each district by the information of practical agriculturists. These official data alone, of those now collected in this country, contain also estimates of produce as well as statements of simple acreage. With praiseworthy energy the East of Berwickshire Farmers' Club in 1849 procured an agricultural census of that county, and achieved it with the expenditure of a single five pound note. In 1853 the Highland and Agricultural Society were permitted by the Board of Trade to make an experiment in three Scotch counties; and a second English experiment was made with the aid of the Poor Law Inspectors. The Scotch effort was again successful, only in three instances throughout the three counties was the information not rendered by the voluntary act of the occupiers.

The English experiment, especially in Norfolk, under the active superintendence of Sir John Walsham, showed that the original hostility of a certain section of the farmers was much mitigated, the failures in that county being only $2\frac{3}{4}$ per cent. In Scotland produce as well as acreage was returned; and in 1854 the whole of Scotland was embraced in the Highland Society's scheme, the funds being provided by the Government. In Table A of the Appendix to this paper I reprint, in a condensed form, a specimen of the elaborate information given both as to produce and weight, matters

which go beyond the scope of our own efforts on this side of the Tweed. In eleven English counties statistics were attempted in the same year; but in this case there was a failure of the machinery employed to collect anything like as closely as in the North, though sufficient success was secured to lead the House of Lords' Committee of 1855 to report distinctly in favour of uniform and compulsory statistics, (1) of acreage, (2) of live stock, and (3) of estimated produce: the last returns to be for districts and not individual farms, and made up in the month of November only. The machinery suggested was that of the Poor Law officials. This mode, however, was objected to on various grounds, and the distaste for the proposed machinery impeded the earlier establishment of even acreage and live stock returns.

The work undertaken by the Highland and Agricultural Society was continued during the years 1854-57. At a time when it is proposed to extend the present official inquiries so far as to embrace, in accordance with the recommendation of the House of Lords' Committee of 1855, an estimate of the actual produce of the harvest, it is well to remember that the estimated produce formed a material portion of the Scotch figures. Nevertheless, such was the confidence of the Scottish agriculturists in the machinery employed, that, recognising the importance and utility of the work, the Scottish farmers readily and faithfully furnished the desired information—opposition being of extremely rare occurrence, not one-fifth of 1 per cent. of the schedules remaining unreturned or unaccounted for. Every county was divided into districts, and enumerators were appointed for each district, who in their turn were aided by committees composed of representatives for each parish; the averages being usually computed for parishes, a mean taken for the district, and a general one for the county. The entire statistical staff engaged under the energetic direction of Mr. Hall Maxwell, the secretary of the Society, exceeded 1,000 farmers, and the public spirit both of the Society and the farmers of the North was fully recognised by the Board of Trade.

The discontinuance of that system must therefore be seen with regret, the cause being the increasing requirements made by the Treasury respecting the minute details of the distribution of the grant, first of 6,000*l.* and afterwards of 4,000*l.* made to the Society, which were deemed incompatible with the generally voluntary character of the inquiry. The amicable relations at first subsisting between the Society and the Government did not in fact stand the strain of the doubtless orthodox remonstrances and disallowances of Treasury officials alarmed lest sufficient "vouchers and particulars" were not forthcoming for several items of expenditure, such as the shockingly indefinite outlay of 7*s.* 10*d.* for pens and pencils.

It may be hoped that the new Agricultural Department we expect to see speedily created, and to which we will look for largely developed statistics, may not find the Treasury, as I am afraid is often the case, a trifle too ready to spoil the ship rather than spend the proverbial ha'porth of tar. When we remember how much public money is distributed, surely some might with propriety be ungrudgingly devoted to the perfecting and extension of our own statistical system.

Mention should be made of the strong recommendation which the question of agricultural statistics received from more than one International Statistical Congress. In 1853, at Brussels, the question was prominent; and seven years later, when the Congress met in London, our national defects in this respect had to be confessed by the late Prince Consort, and resolutions, calling on every State to obtain statistics, both of the area and the produce of its crops, were adopted. In June, 1864, Sir James Caird, in spite of the opposition of the Government of the day, carried at last the resolution which led to the establishment of our present yearly returns. It is these returns which, in accordance with the views of the statisticians of all nations, and with the recommendations of our own parliamentary inquiry, I would urge should be now supplemented by the addition of a produce return. The experience of Ireland, of Scotland in 1854-57, and of most other countries, shows that there is no impossibility in this matter.

Undue attention to Wheat Crop.

Most of the inquiries made into the agricultural products of this country have stopped short at the produce of the wheat crop. This has been so from the crude guesses of our earlier calculators, to the elaborate experiments and valuable records which Sir John Lawes now lays year by year before the country. Wheat has, it must be confessed, always occupied a position of vantage more on account of its very direct and immediate relation to the food of man than of its bulk as an item in our agricultural production. Out of the 47 million acres of land returned as cultivated in the United Kingdom, only 3 millions, that is about one-sixteenth part, is devoted to the growth of this cereal, while the value of the crop, even at the time when wheat was still fetching, as is not now the case, a profitable price, was but from a tenth to an eighth of the aggregate outturn of our farms. On the produce of this crop, however, most of the inquiries which have been attempted were directed, and to far too great an extent we have been accustomed to measure the so-called "harvest" generally, and even the entire agricultural position, by the success or failure of the wheat crop alone. When it is remembered that

the proportions devoted to this cereal vary so enormously in different parts of the country, and reflect on the fact that though a bad harvest usually means loss on all our grain crops, it by no means follows that all suffer equally, I think I may be allowed to plead for greater prominence being allowed to the records of the yield of our other crops. In Ireland, it should be recollected, there is but one acre out of every hundred returned as under cultivation on which wheat is grown; in Scotland less than two acres in the hundred; in Wales, certainly not four. Even taking a ten years' average, and so avoiding laying too much stress on the comparative recent decline of wheat growing, there are several English counties where the percentage of wheat is equally small. In seven, at all events, the entire wheat area does not reach 7 per cent. of the cultivated surface; in sixteen counties not 10 per cent. of wheat land is recorded, while only in one-half of our counties is wheat produced on as much as an eighth of the area under crops of all sorts; in only eight counties does this cereal cover a sixth of that area, and I believe in one county alone—that of Cambridge—is anything like a fourth similarly employed.

The sister cereals of course have been allowed for on the rare occasions where exhaustive and careful calculations of our whole agricultural produce have been made. It is rather in the current and less scientific mention from year to year of what we are supposed to grow, and of how agriculture, as a whole, is progressing, that I cannot but think a far too exclusive attention is directed to wheat alone. In laying, therefore, in the tables in the Appendix to this paper, before this Society fairly complete records of the production of barley, oats, and other crops, as well as wheat, I hope I am at least providing material which may be usefully employed and continued by the statisticians of the future.

Estimates of Yield of Crops.

In attempting to contrast the estimates of yield made by various authorities, much more information is, however, ready to hand respecting wheat than any other grain, and the first and most complete comparative table of produce estimates must, perforce, deal solely with this crop.

In Table B it will be seen I have brought together a record of ten different estimates of the yield per acre of English wheat obtained in different ways, and county by county, at distinct intervals during more than one hundred years. From this it will be seen that in default of official data the voluntary efforts of private individuals, and the laudable endeavours after information of the newspaper press, have come to our aid. The results of the

inquiries in the case of barley and oats I have placed by themselves in Tables C and D respectively.

The first wheat estimate is Arthur Young's, in 1770, and is quoted in Sir James Caird's "English Agriculture in 1850-51." The second set of wheat yields are those given in Mr. McCulloch's work of 1837, but are themselves the reproduction of the data collected by the old Board of Agriculture in the early years of the present century. In the third case, I take Sir James Caird's own figures of 1850. In this case, and that first quoted, although the figures for certain counties are not forthcoming, we have peculiarly careful estimates made after prolonged and personal investigation; and their value is all the greater, since in each case they are the conclusions made on one uniform principle and by a single authority, and not an arithmetical mean of various differing statements. In all the later columns of the table the data is of the second class, and is the result of more or less complete inquiries at not very far distant periods. With the method adopted in all these instances I am perfectly familiar, and I know of course that in any such estimates considerable errors of some moment may from one cause or another creep in. There is, however, sufficient general harmony in the results to enable them to be quoted here, and no little advantage in bringing them, as I have been able to do, side by side, for your inspection and consideration. The first of this class to which I refer was undertaken in 1861 by the "Mark Lane Express" newspaper, which has on several occasions repeated a similarly useful and definite inquiry as to the yield expressed in bushels rather than the very vague reports sometimes tendered of the crop of the year, merely as being "under" or "over" average, and I believe the information given for 1861 represents the opinion of five hundred reporters. The next inquiry quoted was made in 1870 by the "Chamber of Agriculture Journal," with the object of ascertaining by a very extensive series of special reports, the normal or standard yield, not only in every county, but in every poor law union within that county: returns from as many as forty or fifty corn growers in many counties being obtained. The succeeding set of wheat yields is a double one. It comes before us with the more authoritative stamp of being based on information furnished to the Royal Commission on Agriculture which has just concluded its labours, by the four assistant commissioners, whose districts covered the whole of England and Wales. I have not been able in all cases to obtain records of yield collected by these gentlemen. The general practice adopted by the assistant commissioners was so far uniform, that questions as to the yield of farm crops over an average of years prior to 1878, and in the year of our most supreme disaster, 1879 itself, were included in the circulars issued in each

district. But the sufficiency of the replies received varied much in the several areas. Apparently, also judging from the scattered statistics embodied in or appended to the reports, the use made by the assistant commissioners of the information was different in different cases. After a careful search through the statements of Messrs. Little, Druce, Coleman, and Doyle, I took out under each county their published data as to yield, wherever the mention of the matter could be conveniently thrown into statistical form. Throughout the eastern, east midland, south-eastern, and south-western counties, on which Messrs. Druce and Little reported, I found on the whole a fairly representative series of crop yields, and indeed it would have been well had the commissioners themselves worked out for the whole country similar statistical data as was supplied by Mr. Little for his own division. Both Mr. Little and Mr. Druce very kindly placed at my disposal a further supply of data from their notes beyond those taken account of in their published reports, and this extended the basis for a general average. In the north, while the great county of York has been pretty fairly represented in this matter in Mr. Coleman's reports, the other counties in the north and north-west furnish comparatively little information on which averages may be computed. This is still more the case in regard to the western and Welsh counties in Mr. Doyle's district, wherein the number of instances in which he quotes reported yields, especially for any *average* of years, is but few; and the insertion of special instances could not be justified, as I have no reason to suppose them typical. It must be understood therefore that I give these columns for what they are worth, as founded on data collected during the commissioners' inquiries, and though not of equal value in all cases, yet grouped and tabulated for the purpose of giving a general impression of each county's yield.

A review of these figures has necessarily been a somewhat laborious operation, and I cannot present the somewhat imperfect results of it before this Society, without repeating my regret that the valuable information thus collected by the assistant commissioners, not only from individual farms but from large estates, entire unions, or even counties, or sub-divisions of counties, either directly from the most intelligent agriculturists, or through the instrumentality of committees of the various chambers of agriculture or similar local bodies, was not analysed and tabulated on a more extended scale by the machinery of the commission itself. It is evident that had the commission allotted a larger share of their attention to the securing of data of this nature, a vastly greater amount of it might have been accumulated by its able and energetic officers, and an agricultural survey of greater value statis-

tically, even than that most interesting if less definite one which has been accomplished, might have been now in the possession of the public.

One more investigation I quote from the "Mark Lane Express" made in the present year. Although wanting full authority from the comparatively narrow basis of its reports—only two hundred and fifty-one reports being included in the tables—it possesses a distinctive character of its own, giving a special return from its correspondents of the average crops of the past seven years of agricultural depression. Although perhaps useful as evidencing the yield of a very abnormal period, care must be taken not to confuse these exceptional figures with the common term of an "average" crop, and I must be allowed to enter a protest against data so collected being treated as a normal standard of production. A special inquiry into the estimated produce of the year was also made at the same time, but this was before, or at the commencement of harvest, and was an estimate only. The seven years' figures, however, I quote for comparative purposes.

The last inquiry the results of which I compare with the others, is one which has only just been concluded, having been conducted by myself within the past month for one of our agricultural papers, the "Farmer and Chamber of Agriculture Journal." It also consists of two parts—an extensive investigation both by circular, and in very many cases by private application, to agriculturists of all classes, and to millers and corn traders in several instances as well, first into the actual yield of the last harvest, and then into the standard at which the persons rendering the reports in each case would estimate the average or normal yield over a twenty years' period ending with 1882. I am very conscious that even this inquiry is in several instances deficient. But I am convinced from the experience gained in this attempt, that with proper time and staff such an inquiry might be made of the highest value. As it is, it is the first experiment of so extensive a character for many years. Some of the persons applied to for information—all being men selected either by myself or by the many friends who rendered active help throughout our counties, as possessing the requisite knowledge of the crops of their several districts—were unable to furnish the data required; others communicated their views in an interesting but scarcely statistical form by letter. But I find that on the average over eight hundred of those addressed were able to tell me something of what I wanted to know, and over seven hundred and thirty have made reports of more or less value; and in only a trifling percentage of cases did the returns come too late for insertion, or have I been unable to tabulate the information thus sent, and employ it as the basis for the last two

columns of my table of comparative estimates of yields. Every county of England is represented in these latest returns with the exception of Rutland and Middlesex, the chief corn growing counties furnishing the largest proportion of the replies.

It may be worth mentioning that the eastern group of counties, where 30 per cent. of the corn area of Great Britain is found, supplied me with 35 per cent. of my whole number of returns. Another 24 per cent. of these returns was contributed from the south-eastern and east-midland counties, wherein lie rather more than 20 per cent. of the acres under corn. The proportion of the corn area which is embraced by the western and south-western counties is just 16 per cent., and 16 per cent. of my returns came from these counties; while the northern division of England, with $12\frac{3}{4}$ per cent. of the corn, is represented by 12 per cent. of the tabulated reports.

North and South Wales are less fully, but still, I believe, adequately reported on. Scotland was also included in that inquiry, sending me some sixty separate reports; and I gratefully acknowledge the kind and courteous co-operation both of the Secretary of the Highland and Agricultural Society, and the Secretary of the Scottish Chamber of Agriculture, the former Secretary handing me lists of his own selected reporters on the Scotch crops, and the latter invoking the good offices of his directors and the conveners of the county committees of his organisation.

The Scotch part of the data collected I have tabulated separately in Table E in the Appendix, and placed alongside of it a specimen of the Highland Society's complete statistics of 1857, and a note for 1881 of those less formal but still valuable comparisons which the same Society still annually obtains about this period of the year.

I desire, however, also to call attention to an inquiry on a wholly different basis to any of the foregoing, viz., the several geological areas of England, which was made by the "Farmer" in 1867; but this, from its character, could not be combined with the others, and I have given its results separately in Tables F and G. Bearing in mind the bad character of the special harvest represented in this case, the data will be found interesting and instructive.

Grouping of Areas for Produce Statistics.

I ought here to explain the mode of tabulation I have adopted, as it will be seen, the counties in my tables do not follow in alphabetical order. In a paper I read to this Society rather less than three years ago, I suggested the subdivision of England into certain

groups of counties possessing both geographical contiguity and in the main similarity of agricultural features. My object on that occasion was limited to an investigation of the changes in the systems of culture exhibited in a ten years' survey by the figures of our yearly blue book of agricultural returns. It was sufficient then for my purpose to divide England into three belts or zones. I placed in the easternmost division five counties as peculiarly and exceptionally devoted to the growth of corn, and having very nearly two acres out of every three under the plough in 1879. A second area I traced on the map by an irregular line tending southward from the centre of the Yorkshire coast to that of Dorset. This embraced, of course, a much larger area lying to the north, west, and south of the group already referred to, and one which possessed a mean of just over one acre out of every two of arable land. All England to the north and west of this central area I regarded, with but little difference of detail from the familiar classification of our yearly blue book itself, as the peculiarly grass district, its arable land not forming more than one-third of its superficial area.

This rough classification sufficed for the purpose I had then in view. For the purpose of estimating and recording the yield of our crops, and especially of our corn crops, it seems to me we want a closer subdivision of the country, yet one containing larger groups than merely county areas. These are too small and too unequal as units to tell quite fairly what we want to know, and we want a sort of provincial subdivision of, roughly speaking, somewhat uniform area, within which to localise our estimates of production. I allude especially to the corn crops as the leading feature which should guide us in any subdivision, because it is only corn the production of which can be, properly speaking, localised at all. Meat production, to which our own hay and grass crops mainly are directed, cannot be set down to the credit of certain areas; the accident of cattle especially being found in one county or another on the day of the yearly census, tells us nothing of the spot whence they will ultimately go to the butcher. The manufacture of meat is conducted, it may be, partly in one area and partly in another, and the roots of one county contribute equally with the grass of another to the building up of the animal products of our farms, while many foreign countries send a share of their produce to provide us with feeding stuffs for fattening stock.

A recent grouping of our English counties has been suggested by Mr. W. C. Little, one of the assistant commissioners to the Royal Commission on Agricultural Depression. In a series of letters, full of most valuable statistics and memoranda as to the

relative interest and importance of each county in grain production, which that gentleman very recently addressed to the "Farmer and Chamber of Agriculture Journal," and from which I extract two useful tables for reference, lettered respectively H and I, in the Appendix to this paper, he proposed to cut in two the nearly equal bisection of England into grazing and corn counties, which was originally suggested by Sir James Caird, and is now employed in our own official statistics. Mr. Little quarters as it were the counties into an eastern, a south-eastern and east midland, a south-western and west midland, and a northern division, arranging the counties in the following order:—

East.		West.	
Group I. Containing Nine Eastern and North- Eastern Counties.	Group II. Containing Thirteen South-Eastern and East Midland Counties.	Group III. Containing Ten South-Western and West Midland Counties.	Group IV. Containing Ten Northern and North- Western Counties.
(a) Cambridge Suffolk Essex Herts Beds Hunts	(a) Kent Surrey Sussex Hants Berks	(a) Shropshire Worester Hereford Gloucester Wilts Monmouth	(a) Northumberland Durham York, N.R. " W.R.
(b) Norfolk Lincoln York, E.R.	(b) Notts Leicester Rutland Northampton Warwick Oxford Bucks Middlesex	(b) Somerset Dorset Devon Cornwall	(b) Cumberland Westmoreland Lancashire Cheshire Derby Stafford

He recommends these four divisions as clearly distinctive, and they have the advantage of possessing no great dissimilarity in the extent of their cultivated area. That on the extreme east possesses all the English counties which have more than two acres out of every five in corn, the next embraces a smaller percentage of corn-growing acres, and so on. The percentages of corn generally, and of each of the three leading cereals in these great provinces, and in certain subdivisions of these provinces, which I myself suggest, are exhibited in the table subjoined, the figures of which are calculated not on the area under each crop in any given year, but on the mean area in each county during the ten years 1872-81:—

Cultivated Area and Area occupied by Corn Crops in Divisions on the Average of the Ten Years 1872-81.

[000's omitted.]

Divisions or Groups of Counties.	Cultivated Area.	Per Cent. in Cor.	Wheat.	Percentage of Cultivated Area.	Barley.	Percentage of Cultivated Area.	Oats.	Percentage of Cultivated Area.
	Acres.		Acres.		Acres.		Acres.	
I.—Eastern and North- Eastern (a)	2,880,	49	605,	21'0	429,	14'9	137,	4'7
„ (b)	3,222,	42	580,	18'0	452,	14'0	205,	6'4
	6,102,	45	1,185,	19'4	881,	14'4	342,	5'6
I.—South-Eastern and East Midland (a)	2,765,	34	399,	14'4	189,	6'8	236,	8'5
„ (b)	2,979,	31	384,	12'9	263,	8'8	140,	4'7
	5,744,	32	783,	13'6	452,	7'9	376,	6'5
I.—West Midland and South-Western (a) }	3,157,	26	394,	12'5	215,	7'1	109,	3'4
„ (b) ...	2,956,	24	277,	9'4	200,	6'7	179,	6'1
	6,113,	25	671,	11'0	415,	6'8	288,	4'7
V.—Northern and North- Western (a)	3,107,	22	212,	6'8	212,	6'8	219,	7'0
„ (b)	3,188,	15	155,	4'9	67,	2'1	243,	7'6
	6,295,	19	367,	5'8	279,	4'4	462,	7'3
V.—Wales	2,716,	19	104,	3'9	153,	5'6	240,	8'8
V.—Scotland	4,650,	30	94,	2'0	262,	5'6	1,018,	21'9
V.—Great Britain	31,620,	29	3,205,	10'1	2,445,	7'7	2,726,	8'6
V.—Ireland	15,529,	12	161,	1'0	227,	1'4	1,460,	9'4
V.—United Kingdom	47,291,	24	3,377,	7'1	2,680,	5'7	4,196,	8'8

For the localisation of grain produce it will be seen by this table that I purpose to go one step further than Mr. Little, and venture yet again to divide his proposed areas, so as to recast our agricultural map of England into eight corn growing provinces, in each of which sections the proportion of corn diminishes from the section preceding it. Thus in the northern area I think it will aid our investigation to rank Northumberland and Durham with the North and West Ridings of Yorkshire, rather than with Cumberland, Westmoreland, Lancashire, or Cheshire. The dividing line drawn in this case cuts off a north-western group of counties which stand emphatically by themselves as the group least concerned of any in England with the growth of corn, only 15 per cent. of the cultivated area being there employed in this way. It is for some purposes a merit also, I believe, of the plan I suggest, that roughly speaking the cultivated areas, *i.e.*, of course the areas accounted for in the yearly returns, in each of these provinces or districts, are by no means unequal—each of the eight groups on the average of the past ten years' statistics embracing a little under or a little over 3,000,000 acres. To the 24,000,000 cultivated acres of England, I must of course add in a separate division the 2,700,000 of Wales, and the 4,600,000 returned for Scotland, while I append the figures for Ireland and for the United Kingdom (including the Channel Islands, &c.) for convenient comparison.

I have arranged the data I have been able to put together respecting the yield of the chief cereal crops at the present time and at various earlier periods, under counties grouped in the manner I have ventured to recommend, and I would call attention to the detailed results as shown in the tables. Under the arrangement proposed the variation of yield in the several counties or groups of counties may be traced, and so far as we have acreage returns, the gross produce at different periods may be with a little trouble calculated.

With the view of showing how the data thus grouped may be made available to exhibit the relative grain production of different geographical sections of the country, I supply the following statement, which gives a summary of the results of the latest and most complete inquiry into the crops of the past season, and enables us at a glance to see where the chief volume of wheat, of barley, or of oats is raised.

Statement of Average Yield of Wheat, Barley, Oats, and the Gross Produce of each District in the United Kingdom at the Harvest 1882, calculated from the inquiry made for the "Farmer and Chamber of Agriculture Journal."

[000's omitted.]

	Wheat.			Barley.			Oats.		
	Acres.	Yield in Bushels per Acre.	Produce in Quarters.	Acres.	Yield in Bushels per Acre.	Produce in Quarters.	Acres.	Yield in Bushels per Acre.	Produce in Quarters.
I. Eastern and North- Eastern (a)	580,	28·8	2,091,	411,	34· ⁴ ₄	1,775,	145,	53·3	966,
(b)	561,	28·0	1,965,	443,	35·1	1,942,	218,	50·9	1,386,
Total	1,141,	28·4	4,056,	854,	34·8	3,717,	363,	51·8	2,352,
I. South-Eastern and East Midland (a)	366,	29·0	1,326,	172,	34·9	751,	228,	55·4	1,580,
(b)	361,	25·7	1,159,	226,	32·1	908,	139,	43·3	752,
Total	727,	27·3	2,485,	398,	33·3	1,659,	367,	50·8	2,332,
I. Western and South- Western (a)	359,	23·8	1,067,	192,	28·2	678,	123,	38·0	584,
(b)	254,	22·0	701,	174,	30·0	654,	199,	38·0	947,
Total	613,	23·0	1,768,	366,	29·1	1,332,	322,	38·0	1,531,
I. Northern & North- Western (a)	201,	25·0	631,	182,	31·6	732,	238,	41·2	1,239,
(b)	146,	24·6	449,	56,	28·7	201,	256,	40·9	1,310,
Total	347,	24·9	1,080,	238,	31·3	933,	494,	41·0	2,549,
Wales	95,	22·6	268,	135,	27·7	467,	251,	35·0	1,100,
Scotland	79,	31·6	312,	262,	36·0	1,179,	1,049,	41·4	5,428,
Great Britain	3,004,	26·6	9,969,	2,255,	32·9	9,287,	2,834,	43·2	15,292,
Ireland	153,	26·0	497,	185,	34·0	836,	1,397,	38·2	6,671,
United Kingdom	3,164,	26·5	10,490	2,452,	33·2	10,159,	4,245,	41·5	22,030,

If these aggregate results of the latest inquiry may be accepted as giving a truthful picture of the crop of 1882, they show us that the United Kingdom produced a wheat crop of but little under 10,500,000 quarters, whereof nearly two-fifths was grown in the nine eastern and north-eastern counties of England comprised in my first division, and another fifth or fourth of the whole in the second division of south-eastern and south midland counties: some 70 per cent. of the wheat crop of the kingdom being raised in these two sections of England. This is a fact to be borne in mind, as indicating where it is that a falling off of wheat production and diminished scale of prices for wheat falls with peculiar and crushing effect. In the same way the chief regions of the barley and of the oat crop may be seen; the main features of such a table impressing on the mind the comparatively limited

area of the bulk of our wheat growing, and the very different proportion which the oat crop holds in Scotland and Ireland to the rest of the kingdom—a good deal more than half of what is in bulk the largest of all our cereals being the produce of the sister countries. The difference in the yield of the cereals in the different sections of the country is also well worthy of attention, and it is at least curious to see that small as is the Scotch area of wheat, it produced, where it is grown, at all events last harvest, a considerably weightier crop than in England.

Although the comparatively small area devoted to pulse crops attracts less interest to their yield either per acre or in the aggregate, I may append the following table showing the mean acreage produce in bushels as returned to me in the districts quoted on the occasion of the inquiry I have just completed for the crop of 1882, and for the average of twenty years:—

	Peas.		Beans.	
	Crop of 1882.	Average of Twenty Years.	Crop of 1882.	Average of Twenty Years.
England—				
i. E. and N.E. counties	29·1	26·6	34·6	28·0
ii. S.E. and E.M. „	27·4	27·2	32·6	29·8
iii. W. and S.W. „	22·1	24·0	27·6	25·0
iv. N. and N.W. „	27·0	26·8	30·9	26·9
Wales	20·6	22·8	34·0	33·0
Scotland	27·3	28·7	33·5	31·5

So far as the root crops are concerned, they must be mainly regarded as employed in the manufacture of beef or mutton, and so are not an ultimate but only an intermediate product. Less importance attaches to their localisation, especially as the meat production of the several counties or provinces is a matter which cannot, as our returns are now collected, be localised at all, owing to the moving of stock from one part of the country to another.

It may, however, be worth while to give briefly the estimated produce of the past year in this case also, in tons per acre:—

	Turnips.		Mangolds.		Potatoes.		Hay and Clover.	
	1882.	Average.	1882.	Average.	1882.	Average.	1882.	Average.
England—								
i. E. and N.E. counties	18·6	15·4	19·6	22·3	5·4	4·9	1·7	1·4
ii. S.E. and E.M. „	17·1	16·0	19·8	23·2	4·9	5·3	1·7	1·3
iii. W. and S.W. „	16·8	17·1	19·9	23·0	3·4	5·0	1·7	1·4
iv. N. and N.W. „	18·3	18·2	16·0	17·8	5·7	6·3	2·1	1·7
Wales	14·0	15·9	15·4	20·3	3·0	4·1	1·5	1·7
Scotland	17·8	16·6	14·0	14·0	3·1	5·8	1·9	1·6

Fluctuations of Yield.

Looking, however, at England as a whole, there is much that is interesting in the fluctuation of the mean yield of the country at the different periods noted in the tables which I append. It may be noticed that the 23 bushels at which Arthur Young placed our English wheat crop in 1770, was lowered subsequently to 21 bushels, the mean of the figures McCulloch quoted from the Board of Agriculture Reports. In 1850 Sir James Caird's careful estimate showed a material advance to an average of $26\frac{1}{2}$ bushels. Eleven years later the decidedly higher estimate of 29 bushels was arrived at by the "Mark Lane Express" inquiry. Sir James Caird, it may be remembered, in a paper read to this Society, estimated the yield at a bushel less, or 28 bushels, in 1868. The "Chamber of Agriculture Journal" returns of 1870, which are given in my tables, raised the estimate for all England to within a minute fraction of 30 bushels, and the result of the entirely independent inquiries made under the late Commission virtually corroborates this high figure, giving as the mean of thirty-six counties a pre-depression average little under $29\frac{1}{2}$ bushels. The average of the Assistant Commissioners' statistics of yield in 1879 is somewhat higher than the commonly received version of that most disastrous year, working out at 19.7 bushels per acre. The "Mark Lane" estimates of the average of the seven depressed years 1876-82 appears to be 24.7 bushels; while the results of the inquiry now reported by the "Farmer and Chamber of Agriculture Journal" show the normal wheat yield over Great Britain to be still held by a large array of competent inquirers to reach 28 bushels, although the crop of the present year is but $26\frac{1}{2}$ bushels.

The fluctuations of the English barley crop are equally deserving of attention. Taking McCulloch's estimate as a starting point, the mean for England was 32 bushels at the opening of this century. Both Sir James Caird in 1850, and the "Mark Lane" in 1861, raised the average to 38 bushels, while my own inquiries this autumn tend to place an average crop for Great Britain at somewhat less than 35 bushels, and the barley crop of 1882 at no more than 33 bushels, figures which tend to indicate that the production of barley, like that of wheat, has received a manifest check.

Even in the case of oats, though the crop of 1882 has been exceptionally good in England, nearly reaching 46 bushels per acre, my inquiries incline to a lower normal average, not much over 40 bushels, than that prevailing in the 1861 and 1850 inquiries when 46 and 44 bushels per acre were counted on.

Estimates of Total Production.

It is time, however, to inquire how far the fragmentary records of production, which alone we have in this country, can be utilised to enable us to estimate the gross outturn of the great rural industry whose sufferings have been the theme of most recent inquiry. We have many reasons to distrust the basis on which many earlier estimates were constructed, but the more recent conjectures and calculations may help us to some knowledge of the advance or decline of production.

Before the commencement of this century, Arthur Young, in his report on Essex, valued English agricultural produce at 145,800,000*l.*; but as his acreage basis was wrong, this was probably excessive. Other estimates are referred to by Mr. McCulloch, such as those of Mr. Middleton, who put the total at 126,690,000*l.*; or of Mr. Stevenson, in the "Edinburgh Encyclopædia," who placed it at 131 million pounds. McCulloch himself named a figure close to this, or 132,500,000*l.*, for English agriculture alone, and adding his estimates for Scotland, we get a total of 155 million pounds; but from this he deducts 12 million pounds for seed, and to keep up the stock of horses, arriving at a net sum of 143 million pounds. As the population in 1836 was taken at 18 millions, very nearly 8*l.* a head was the estimated production in Great Britain nearly fifty years ago. Ireland was separately reckoned as yielding in the gross from 45 to 55 million pounds. Thus, according to McCulloch's estimates, we shall arrive at a total for the United Kingdom nearly half a century ago, deducting simply seed and replacement allowances, of from 183 million pounds to 193 million pounds, accordingly as the higher or lower Irish estimates are adopted. Owing to the low figure given to Irish produce, the head rate for the whole kingdom would not even with the higher figures much exceed 7*l.*

A comparatively recent estimate of the gross production of the United Kingdom, to which, of course, we naturally turn for the truest approximate of the whole supplies our crops and stock furnish, is embodied in Sir James Caird's introduction to that very valuable series of reports on British agriculture which the Royal Agricultural Society of England presented to the International Agricultural Congress at Paris in 1878. In an earlier paper addressed by the same high authority in 1868 to this Society, an estimate of home produce as measured by value and contrasted with foreign food supplies, was given. It distinguished between the production of the three divisions of the United Kingdom—a not unimportant matter when the special character of Irish agriculture is remembered—whereas in the second, which was in other respects

much the fuller estimate, the United Kingdom was dealt with as a unit. But as the form and design of the two statements does not admit of their being conveniently put side by side, or their totals taken as parallel views of gross production at dates separated by a complete decade, I can only refer to the later statement, as that now most usually quoted. It showed a total value of 261 millions of home produce, or very nearly 8*l.* per head: no very great rise from McCulloch's estimate forty years before. Sir James Caird's figures may be thus analysed:—

[000's omitted.]

	Production of the United Kingdom in 1878.	
	Weight.	Value.
(a.) <i>Vegetable Products—</i>	cwts.	£
Corn	177,000,	87,087,
Potatoes	111,000,	16,650,
Hay and straw	120,000,	22,000,
(b.) <i>Animal Products—</i>		
Meat	24,500,	87,000,
Milk.....	—	26,000,
Cheese and butter	3,000,	13,500,
Wool	1,214,	8,500,
Total	436,714,	260,738,

In the interval between this calculation and the earlier one by the same high authority made ten years before on wholly different lines, it is remarkable that while corn and potatoes, two items which by themselves at least may be compared, jointly contributed in value only a single million pounds to the increased production; on the other hand, the development of animal products was most remarkable, the single item of meat rising by 40,000,000*l.* or 85 per cent. in this one decade. There is, however, a consideration which ought not to be overlooked, and which, quite apart from the different level of values, explains away a large portion of this extreme rise, for in the earlier estimate—framed rather for purposes of comparison with foreign supplies, than designed to show our own production here—all meat produce from pigs is excluded, on the ground that they are virtually already accounted for in the meal and potatoes. In the later figures bacon and pork are specially allowed for as meat. If therefore these forms of food represented in value (as Mr. J. A. Clarke maintained in the same series of Royal Society's essays, in 1878) the large aggregate of upwards of 20,700,000*l.*, more than half of the apparent enormous rise in meat appears to be accounted for.

Meat Production.

I have devoted a good deal of labour to the closer investigation of this intricate question of meat production, but the conflicting information to be gleaned in different quarters, and the strangely varied estimates of the authorities who have approached the details of the subject, have to some extent rendered me more uncertain than when I began what I am bound to confess is an incomplete inquiry. I find that in the older conjectures of agricultural economists, the vagueness which I have noted as to areas is far outdone by the divergence prevailing even as to the numbers of our live stock. Arthur Young himself made more than one widely different estimate. In 1779 he proposed a figure somewhat short of 3,500,000 head to represent our cattle of all ages and descriptions in England and Wales. McCulloch in 1837 gave for England and Wales a total of over 4 million head; and he pointed out that despite the increase of tillage which distinguished the earlier years of this century, the stock of cattle had certainly augmented. In 1854 the Poor Law Inspectors, on the basis of the statistical experiment they had made in the counties of Hants, Wilts, Leicester, Norfolk, Suffolk, Berks, Worcester, Salop, Brecon, Denbigh, and the West Riding of York, ventured to estimate the cattle of all England at only 3,400,000, of whom, roughly speaking, they took 40 per cent. as cows, 40 per cent. as grown cattle, and 20 per cent. as calves.

The guesses at our sheep stock have been still wider. Very early in the century foreign calculators have credited us with 45 and even 55 millions of sheep; McCulloch was, as usual, nearer the mark, placing the English flock at 26 millions, the Scotch at 3,500,000, and the Irish at little over 2 millions, and suggested an aggregate of 32 millions in 1847.

We now know the numbers of live stock pretty accurately, and the districts where they are found in summer, but we are still puzzled by differing estimates of the meat they yield us. In 1837 McCulloch calculated that exactly a fourth of the cattle were slaughtered annually, and his estimate of the annual value of English beef and veal produce was just under 15 million pounds; mutton he took at 10 million pounds, and for pig meat he estimated only a value of a single million, making the entire meat production of that period a matter of 26 million pounds only, or less than the wheat crop of the period: whereas we have seen the latest estimates of our time represent our home grown meat supplies as worth fully as much as our whole grain crops collectively.

In his estimates of meat production in 1868, Sir James Caird also assumed that a fourth of the whole head of cattle of all ages in these islands came annually to the butcher, as well as one-third of the English and Irish, and one-fourth of the Scottish stock of

sheep; and at an overhead value as to cattle of 16*l.* in England, 8*l.* in Scotland, and 7*l.* in Ireland, and an average price of 35*s.* each for sheep, he reached in 1868 a total meat value, leaving pigs out of account, of 47,200,000*l.* The vast rise in the value of meat from McCulloch's time would of course alone explain much of this increase. Taking from the "Royal Agricultural Society's Journal" of 1878 the prices per lb. actually realised for live animals by the producers of ordinary as distinct from high class stock, it would seem that between 1849 and 1868 beef rose from 4½*d.* per lb. to 7*d.* per lb., and mutton from 5*d.* per lb. to 7½*d.* per lb., or 50 and 55 per cent. respectively. These altered values must be remembered when the growth of production is measured by value; but there can also be no doubt that in this interval the production of meat was greatly augmented, a much advanced rate of consumption prevailed, and the earlier maturity of our improved system of agriculture furnished the meat demanded by the people.

The two estimates most quoted as to meat production are the elaborate calculations of Mr. H. S. Thompson, in 1871, and Mr. J. A. Clarke, in 1871-73 and 1875. I find that Mr. H. M. Jenkins, in his interesting paper on the production of large and small farms, in 1872, adopts the former estimate. Mr. James Howard in 1876 follows on the whole the second, though he made some suggestions for altering the weight originally suggested by Mr. Clarke, especially in the case of pigs. Mr. Bourne, in his very valuable inquiries into our food supplies, also relies on Mr. Thompson's data, as most valuable for comparative purposes. Sir James Caird, in his 1878 estimate, in naming 1,225,000 tons as the meat production of the United Kingdom, arrives by, I presume, an independent road, somewhat like that he followed ten years before, at a figure practically identical with the earliest of Mr. Clarke's three estimates, that made in 1871, on the basis of the average stock of 1867-70, which gave a total of 1,214,000 tons.

It may therefore help us if we contrast the estimates of Mr. Thompson and Mr. Clarke, and the former estimates of the latter gentleman, with the corrected calculations he has supplied for later years:—

	Mr. Clarke, 1867-70.			Mr. Thompson, 1871.		
	Cattle.	Sheep.	Pigs.	Cattle.	Sheep.	Pigs.
total number	9,032,000	34,116,000	3,522,000	9,348,000	31,417,000	4,137,000
umber slaughtered	2,581,000	17,058,000	3,522,000	2,337,000	13,195,000	4,799,000
ercentage "	29	50	100	25	42	116
verage weight, in lb.	560	56	90	600	60	134
ggregate weight of beef, veal, mutton, lamb, pork, or bacon, in tons.....	645,000	426,000	143,000	626,000	353,000	287,000

These two estimates, it would seem, did not vary greatly in the aggregate; the details are however differently made up. In the case of beef and veal, though Mr. Clarke assumes 29 per cent. as against 25 per cent. to be slaughtered annually, he took at the time a lower average weight than Mr. Thompson, and so the estimates of both authorities were not far apart. The results in mutton and lamb differ in the proportion taken; but Mr. Clarke's estimate starts also from a higher average number of sheep. The estimate of meat supply furnished by pigs varies materially, twice as much being obtained according to Mr. Thompson as according to Mr. Clarke. The last named gentleman, however, modified his figures considerably in two later years, first in the tables submitted to the Select Committee on Contagious Diseases (Animals), 1873, and again in the data published in 1875, and embodied in his 1878 report on British agriculture. I give these further calculations under the dates 1873 and 1878 respectively, so far as I can discover the figures, but the head of stock on which the result is based seems rather an estimate for a somewhat earlier period than the live stock census of those particular years:—

	Estimate, 1873.			Estimate of 1875 and 1878.		
	Cattle.	Sheep.	Pigs.	Cattle.	Sheep.	Pigs.
Total numbers	9,260,000	33,000,000	—	10,143,000	33,000,000	—
Number slaughtered	1,750,000	10,640,000	4,846,000	1,935,000	9,000,000	4,800,000
Percentage	19	32	—	19	27	—
Average weight, in lb.	514	67	134	637	69	149
Aggregate weight, in tons ..	401,000	318,000	288,000	550,000	278,000	319,000

Without entering into the extremely intricate details of the several estimates, the proportion of young animals to grown stock slaughtered, and so on, it is easy to see the fluctuations of opinion as to the total of meat produce. On looking into the several elements of each calculation, it will be seen both Mr. Clarke's later tables indicate a remarkable reduction as to the proportion of cattle and sheep slaughtered, less than one-fifth in place of more than a fourth. There is, however, an increase in the weight at which the average carcass at all ages of each class is to be computed. The weight of cattle slaughtered according to Mr. Thompson is taken as 626 lbs.; while Mr. Clarke makes it first 560 lbs., then reduces it to 514 lbs., and finally raises it to 637 lbs. Sheep show some, though not the same, variation, and pigs vary most of all. So much so that with the 1871 figures of Mr. Clarke, and at 7d. per lb., this class of produce represents only some 9,500,000*l.*,

whereas the sum would be, as we have seen, well over 20,000,000*l.* sterling if the last and highest estimates be accepted as correct.

According to these figures we have three estimates varying, as it were, from over the 1,200,000 tons arrived at on independent grounds both by Mr. Thompson and Mr. Clarke in 1870-71, to only 1,000,000 tons in 1873, and back again to 1,147,000 tons on the later date. In the perplexity caused by these several estimates, the question has been asked, whether, since there is no insuperable difficulty in calculating the weight of the foreign butchers' meat imported, either in the shape of live or dead imports, we could not, by reference to an assumed standard of average consumption, discover by this means a test as to which of the three systems is nearest the mark, in estimating the home production. On the population of the several dates the three sets of figures named represent a head rate supply of home-grown meat of 87 lbs. each in the first instance, 70 lbs. in the second and lowest instance, and 78 lbs. in the last. The foreign supply, which is known, and (if the estimates employed as to average weight of foreign live stock are good) which may be closely calculated, would appear to be about 9 lbs. on the first, 14 lbs. on the second, and 21 lbs. on the third of these occasions. Placing British and foreign meat together, this would seem to imply a fluctuating consumption of 96 lbs., 84 lbs., and 96 lbs. as respectively occurring at the different dates. To me it seems the lowest of these head rates is too low to be right. It is not likely such changes of meat consumption took place in our population. But it should be remembered if the principle on which the latest data are made up be accepted as the most correct, then we should have to reduce the 1,200,000 tons of the 1871 estimate by about one-sixth; and if we did so reduce the home supply, it would appear that there had been a considerable increase in the head rate of meat consumption between 1870 and 1875, since the consumption of the earlier year would be but 72 lbs., including all sources of supply. Applying the data as to beef and mutton of the latest of these figures to the present live stock of the country, and taking in the matter of pigs the 116 per cent. allowance for slaughter which Mr. Thompson originally proposed, it might be possible to see what the existing meat production is to-day. Adopting Mr. Clarke's latest method of calculation, it would seem that something scarcely if at all over 1,000,000 tons is now produced, while if Mr. Thompson's more liberal scale of production be still adhered to, the outturn would still not much exceed 1,240,000 tons. If the first of these figures is anywhere near the mark, it would, roughly speaking, indicate a head rate consumption of only 63 lbs. of home grown meat. If the larger figure be right, then 78 lbs. is the yearly meat ration our

own stock now supplies. As the foreign supplies of meat and live stock are now ascertained for 1882, it would seem the total meat available from abroad comes to very little over 22 lbs. a head. It would therefore follow, if we are to keep to an assumed consumption of something like 100 lbs. per head, the larger of the two home estimates must be held to be the most accurate. If the other can be substantiated, and no one who has examined in detail the elaborate data on which Mr. Clarke based his calculations can deny it has intrinsic claims on our acceptance, then it would follow that there had been a falling off and not an advance in meat consumption in recent years.

Milk and Dairy Produce.

Another very interesting branch of our farm production is that of milk and dairy produce. Here also a good deal of uncertainty exists as to facts, and I have been unable to complete my inquiry to my own satisfaction. Writing in 1878, Mr. John Chalmers Morton, whose right to speak with authority on the matter is considerable, placed the milk produce of Great Britain at 1,000 million gallons annually, reckoning 440 gallons per annum to each cow. Mr. Clarke, in the same volume of the Royal Agricultural Society, thinks 420 gallons a safer estimate. But adhering to the larger figures, it may be well to quote Mr. Morton's estimate of the ultimate disposal of this milk: one-sixth part or 167 million gallons he allows for the calves reared, which cannot of course be reckoned with as part of the yearly produce at all; 312 million gallons of milk he would apportion to cheese making, giving us 2,800,000 cwt. of cheese yearly; 156 million gallons go, he tells us, to produce 530,000 cwt. of butter; leaving a million gallons a day, or 365 million gallons in all, for the daily milk consumption of our population. But these estimates must be materially added to if the Irish dairy produce be considered, while it is not improbable that the increased consumption of milk which has undoubtedly taken place since 1878 is met by a reduction both in butter and cheese.

Wool.

Wool, although not an article of food, must not be left out of account in any estimate as an important item in our national production; but the precise amount at which it should stand either as to quantity or value has been a matter of some controversy. The following are some of the estimates of quantity made at different periods during the century:—

ENGLAND ONLY.

Date.	Authority.	Number of Sheep.	Method of Calculation.	Weight of Clip in lb.
'80 {	Mr. Luccock, Wool Merchant (Leeds) }	26,148,000 {	Long woolled 4,153,000 Short „ 14,854,000 Total shorn..... 19,007,000 Add for sheep slaughtered and carrion (long wool) } 1,230,000 Ditto (short wool) 4,433,000 Lambs 1,470,000	94,377,000 }
'28 {	Mr. James Hubbard and Sir George Goodwin (Leeds) }	—	—	111,161,000 }

UNITED KINGDOM.

'45...	Professor Low	35,000,000	Average weight per fleece, 4½ lb. ...	157,500,000
'58 {	Mr. E. Baines, at British Association (Leeds)	{ —	—	{ 175,000,000 (15,000,000 exported)
'70 {	Mr. Archibald Hamilton, Statistical Society's <i>Journal</i> , from Messrs. Hubbards' tables	{ 34,138,000 (all ages)	Sheep shorn yielding 124,000,000 lb. Lambs shorn in certain counties } 2,470,000 „ Skin and wool 33,482,000 „	{ 159,952,000 }
'75 {	Earl Cathcart, in "R. A. S. E. Journal," from Messrs. Hubbards' tables ...	{ 22,189,804 (one year old and upwards only considered)	Sheep in 1867-69, weight of fleece worked out county by county, but only sheep actually shorn allowed for	{ 124,000,000 }
'78 {	Mr. J. A. Clarke, "R. A. S. E. Journal," 1878, from Messrs. Hubbards' tables.....	{ 21,492,000 (one year old and upwards only considered)	Sheep in 1875-76, worked out as above; average weight of fleece 5½ lb.; no allowance for lambs and slaughtered sheep	{ 119,473,000 }
'78...	Sir James Caird	—	—	136,000,000
'80 {	Helmuth Schwartze and Co.'s Wool Circular	{ —	Estimate of shorn sheep : Average 1870-74 157,000,000 „ 1874-79 155,000,000	{ 157,000,000 155,000,000 }
'82 {	"Bradford Observer," wool tables	{ 27,840,000 (in 1881)	Calculated on both sheep and lambs at fixed weights of fleece by counties (average 5¾ lb. per fleece), and deduction made from total of 3 lbs. per head on lambs of 1882 + aggregate decrease of sheep and lambs between 1881 and 1882, which is taken to represent the slaughtered sheep of the year	{ 129,000,000 }

It will be seen that in most of these cases a material difference is evident, even when a similar basis is used as a starting point. Thus, although founding on Messrs. Hubbards' tables employed by Mr. Archibald Hamilton in his valuable paper of 1870, Lord Cathcart and Mr. Clarke make the very material difference of refusing any allowance for fleeces of slaughtered sheep and lambs, thus greatly reducing their estimate below those of other authorities. It is however well worth noting that if Mr. Hamilton's complete plan be adopted, the yield of British wool this year works out in remarkably close correspondence with the 129,000,000 lbs. which is reached by the "Bradford Observer" tables: the actual figure being 128,815,000 lbs. Under the lower scale adopted by Mr. Clarke the wool clip of this year would not quite reach 100,000,000 lbs., or not much more than was thought to be grown at the commencement of the century. I cannot but view such a figure as decidedly too low, though the ravages among our flocks threaten largely to reduce our yearly clip. Over a series of years, and taking the "Bradford Observer" data, we are able very clearly to see by the following figures the important decline both in production and in value which has taken place in this one item of wool: pointing out, however, that the values are only roughly given, and taken on the quoted prices of Lincoln hogg wool:—

Date.	Clip in lb.	Average Price.	Total Value.
		<i>d.</i>	<i>£</i>
1873	165,350,472	24 $\frac{1}{2}$	16,880,000
'74	167,042,379	20 $\frac{3}{4}$	14,439,000
'75	161,782,536	19 $\frac{3}{4}$	13,313,000
'76	155,835,320	17 $\frac{3}{4}$	11,525,000
'77	152,172,010	16 $\frac{1}{4}$	10,303,000
'78	151,700,736	15	9,481,000
'79	153,233,696	12 $\frac{1}{2}$	7,981,000
'80	148,729,061	15 $\frac{1}{8}$	9,373,000
'81	138,574,672	12 $\frac{3}{8}$	7,145,000
'82	129,006,659	11 $\frac{1}{4}$	6,047,000

Such a table affords very specific evidence of diminished produce, and still more diminished value in the past decade. It is well worth remark that while the gross produce of wool is thus less by some 22 per cent., the value of the wool crop to the British farmer is lessened in a far greater ratio.

Diminution of Produce.

Having run through the more prominent items of agricultural production, it was my intention to have offered some rough estimate on the basis of such calculations as have been made as to the total produce now compared with our latest estimate, that of

Sir James Caird. I have been disappointed in my hope of doing this. Far more care and deliberation would be required, and much longer reflection than I have had time for. The story of reduced production has, however, been told to the Royal Commission not only in estimates for the whole country, by three statisticians, two of whom have held, and one now occupies, the chair of this Society, and I do not yet despair of seeing the basis of their several calculations discussed here. Many facts bearing on the matter also are reported for large areas by the Assistant Commissioners, and many more individual and typical instances might be collected from the evidence. I would only here remind you that Sir James Caird has himself forcibly represented the six years' loss in the United Kingdom as equivalent in money value to something like two years' rent of the whole land of the country, or in the aggregate, 139,000,000*l.* This if averaged on each year would represent a yearly diminution of receipts equal to some 23,000,000*l.*; and by as much as that at least I conclude he would reduce his own figure of 1878. Mr. Lefevre's figures, which were very different in their form, and restricted to Great Britain alone, landed us in a loss, which, spread equally in the shape of an annually diminished production over each of the six years, would be something like 26,000,000*l.* per annum. Mr. Giffen's much more elaborate calculation, based on the excess of imports over a given period beyond what would have been needful for the increased population appears to rest on a higher head rate of total consumption than that of Sir James Caird (who in his evidence to the Royal Commission took 9*l.* 5*s.* 6*d.*, only as the standard). He held that in the aggregate though lowered prices were a more material consideration than reduced production, grain produce was diminished in value by nearly 24 million pounds, leaving us a crop of 63 million pounds only, in place of one of 87 million pounds; while on the whole balancing certain advances against heavy reductions of outturn and of value, from 38 to 45 million pounds were of late years lost. This, however, was not a statement of actual diminution of production, but a comparison of debit entries against the farmer, and included outlays paid by one member of the agricultural class to another in rent or wages. Excluding these, the outcome of his figures would still leave us a production which must be at least 30 million pounds a year under that of happier days, and it would appear to be the highest of the three calculations I have mentioned.

I am very reluctant to refrain from prolonging my paper in the direction in which these extremely interesting statistics tempt me, but I am unfortunately compelled to do so; and before passing to the consideration of how produce statistics have been and may be achieved, I will only express the hope that some of the data I have

now gathered as to yield of crops may furnish reliable material for the further investigation of a not yet satisfactorily solved question. I will however notice that taking the grain crops alone, and making those necessary deductions from the bare figures of any such returns as I have only noted before reaching the statistics of *available* produce, I hardly see how the produce of grain and pulse crops, bearing in view present prices, or those prevailing of late, can in the gross exceed 60 million pounds, as against the 87 million pounds of our latest complete estimate. It remains, however, a question worth fair inquiry, how far the non-agricultural horses of the country should be taken account of as a product, or how far in their case, and that of pigs, and even other live stock, some rectification of the totals of grain outturn should not be made lest we reckon the same products twice over. There are, nevertheless, many minor items which may be set against such errors in the special products of hops and vegetables not included in the larger estimates, and in the case of eggs and poultry, and I would add, even timber, which do not seem to me embraced as they ought to be in the customary estimates of our production.

Whatever be the actual figures which properly represent the produce of British soil, two conclusions are, I think, easily drawn from the varied figures I have been able to put before you—one, that the former advance in yearly production is unquestionably checked, that the possibility of future increased production is arrested by the risk of unremunerative enterprise. While no legislation can restore productive climatic conditions, and prevent a loss of capital due to rainfall and want of sun, there is room for many minor improvements of the law, whereby agricultural investments may not be artificially depreciated, and the land, and the capital locked up in its cultivation, no longer treated by the State with financial disfavour, and made to bear exceptional and impolitic burdens.

Foreign Produce Statistics.

As I have already pointed out, the portion of our English statistics which is still omitted here, and without which we are so largely in the dark as to our total agricultural production, is a prominent feature of the system of foreign countries. The modes adopted are not everywhere the same, and there are unquestionably a good many defects and imperfections in the methods practised, but it will not be out of place, in reference to our possible attempt to establish produce statistics here, to note how this work is attempted and how it is done elsewhere.

In the United States the organisation of the Statistical Bureau of the Washington Agricultural Department has at its command

(I am informed by the representative of that department in London, Mr. E. J. Moffat) the services of a regular but unpaid local staff of some three thousand reporters, representing virtually the whole producing area of the country, county by county. The number of reports from each county varies with its size; and there are now in each State special statistical agents, who tender, I believe, more comprehensive reports, and who supervise and systematise the local information. The latter are of course paid agents, while the services of the ordinary reporters are only remunerated by copies of the agricultural publications of the department. The vote appropriated last year by Congress for crop reports and special statistical work in printing, &c., was, I am told, 16,000*l.*—about the same amount which the collection of our own statistics costs. But this, I take it, may probably not include the cost of the new State agents. The annual system of crop reports is now familiar to us here, consisting as it does of monthly statements of the relative *condition* of the growing crops, signifying the excess or diminution of condition below or above the normal standard, which is taken at 100. The reports bear first on the acreage compared with the previous crop, then on the efficient growth and vitality of the yet unmaturing crop, and finally the yield per acre, with the quality and comparative quantity. Of course the reliability of the statements rests much on the discretion and knowledge of the reporters; but the system seems, if fairly worked and conducted by energetic statistical agents, one which could be reproduced in our own country without great difficulty. If the number of agents named suffices for the enormous area of the United States, then the eight hundred reports from our own country which I have lately collected, show that it would be easily practicable here to furnish a relatively closer and more reliable basis in England than in America.

Russia, next to America, was, at one time looked to by English agriculturists and corn traders with a good deal of agricultural anxiety. Their statistics have been forthcoming in different forms; but the last published Russian figures for this country in our official tables here do not appear to come down to a later date than some ten years back. I understand, however, from information obligingly furnished me from the United States' Consulate here, that they are informed by the Director of the Russian Department of Agriculture and Rural Economy at St. Petersburg, that a complete system has been recently established and brought up to date. Upwards of two thousand correspondents have been specially selected from persons interested in practical agriculture. Three separate reports on the Russian crops are now rendered in spring, in summer, and in autumn, in reply to the questions of the Department, and on this

information official records are based. The first report embraces the prospects of the young crops, and condition of live stock; the second includes information as to wages as well as statements as to crops; and the final official reports of the year, besides giving the average yield, publish useful data as to the market price of farm products, and of live stock, and the average weight of grain per chetvert, indicating all changes in the mode of culture, and furnishing, as our own agricultural returns have, I am sorry to see, ceased doing, comparative data as to the production of foreign countries. The complete reports for 1881, and the two earlier ones for 1882, are, I believe, already published.

For intelligence as to the practices of other foreign countries, I have to tender my best thanks for the information kindly placed at my disposal by Mr. Bateman, of the Board of Trade. The French statistics are obtained in separate instalments; the breadth of autumn sown crops being rendered on 11th December yearly, and spring sown crops on 15th May. Some weeks later a report on the condition of the corn crops at flowering time appears, together with a complete acreage statement. In August, we have approximate estimates of yield. In November, a final estimate furnishing the latest data on this head, and a month later the average weights of wheat, barley, oats, and rye are given. Intermediate monthly reports are also rendered, and the whole of this information is collected through the prefects and their staff, the mayor of each commune, with the aid of a local council, I believe, making local reports. This year a specially elaborate decennial census of agriculture has been taken, that of 1872 having been omitted. Commissioners in each canton were appointed for this purpose, with sub-commissioners in each commune when necessary. The services thus rendered are honorary, but a number of gold, silver, and bronze medals are to be allotted to the most deserving members of the commission.

In Germany, estimates of the mean produce of corn and other crops are taken yearly, but only in some of the States is the acreage annually verified, a fact which renders inaccurate the total returns of produce, yearly figures of both acreage and yield being published for the whole empire.

In Austria, use is made by the Government of the various chambers of agriculture for the collection of produce statistics, these bodies receiving from the Government a subvention for this purpose. The data for 1881 appear in our returns.

In Belgium, only the estimated mean yields are obtained annually, the final agricultural statistics being compiled at considerable intervals. In Mr. Jenkins's report on Belgium for the Royal Commission, he points out that the latest complete agricultural statistics of Belgium were collected as far back as 1866, and published in 1870.

In Norway all occupiers were required, in 1875, to make returns of acreage and live stock. Yearly returns of produce and of the value of stock are obtained by the chief officers of large areas. These are taken from the average of certain specimen farms in each subdivision of these areas, but are only estimates.

In Sweden, where a new statistical system has been proposed, but not yet carried out, reports are now made by the Central Department of Statistics from acreage returns obtained by the Economic Society, and from the reports on crops, as "good," "average," and so on, rendered in October by the local authorities.

In Denmark the area under crop is enumerated only every fifth year, the last made public being for 1876. Reports of average yield are, however, locally collected in all parishes, and from these the total produce is calculated at the central office, the value of the crops being also given. The absence of a yearly record of acreage in this case, as in Germany, must render the figures inaccurate.

Taking the foreign statistics, imperfect as some of these are, I had hoped it might have been possible, with the recent data kindly furnished from the Statistical Department of the Board of Trade, roughly to show the relative grain production per acre of the different countries, as I have done our own, for more than one date, and to place this side by side with our own and our colonial production, giving similarly parallel statements of the number of our herds and flocks; these forming legitimate matter for comparison; but I have been reluctantly compelled to acknowledge my inability to complete in time the plan I had projected, and must leave this part of my paper incomplete. The subject of comparative production may well, however, afford scope for future interesting inquiries, which I hope some other member of this Society may undertake.

I cannot, however, pass from this part of my subject without expressing the regret which I know is felt by agriculturists at the discontinuance in our yearly agricultural statistics of the comparative foreign data which formerly was given. Expense may be saved to the Treasury by the virtual burying of the foreign and colonial agricultural statistics among the miscellaneous data belonging to the countries concerned, but a very distinct hindrance to ready and convenient investigation of many agricultural questions is thereby imposed.

Produce Statistics at Home.

I am now brought to inquire definitely whether, seeing the need of such data, as other Governments more or less perfectly collect, we may not proceed to attempt to carry out a system, and it may be even a better system, at home. I am well aware of the difficulties of reaching even approximate accuracy, and at one time I almost despaired of the practicability of such work. Having now, as

I have already said, just finished the most exhaustive private inquiry of recent years, I must give it as my opinion that there would be no impossibility of doing at least as well, and, I trust, even better in collecting information as America, or Austria, or Russia. If an unofficial person in my position could, with somewhat hurried and imperfect preparations, procure over eight hundred individual opinions from districts so scattered as to fairly represent the cultivated area of Great Britain, I do not think the new Department of Agriculture, when we get it, need despair. The machinery of the existing Chambers of Agriculture would in many, though perhaps not in all instances, prove valuable for the purpose, and every Farmer's Club and every Agricultural Society might be pressed into the service. In some instances you may, no doubt, have refusals to help; and Mr. Rankin, member for Leominster, informs me that as the result of a recent correspondence with the agricultural chambers, he still finds much disinclination on the part of agriculturists to make returns of produce; but what public bodies may shrink from doing officially and on their own responsibility, the more intelligent individual members will probably do personally: and I hardly think, if approached by the new Department, the agricultural organisations of the country would decline to be the medium at least to select the proper reporters for each area. The opposition to a local examination of statements of yield would not apply to their compilation in a wholly independent central office. Great tact will of course be necessary in any combination of official and voluntary work, and you must not be discouraged by being told, as I have been, that all such investigations are "worse than useless," that such questions are "dreaded by many," as likely to be followed by "increased rents:" not, by the bye, an anticipation very common in rural districts in these bad times. In connection with any produce inquiry, which cannot well be made till late in the November of each year, we might perhaps, at least occasionally, have a supplementary return of live stock. The want of a winter to compare with our summer census very greatly impedes the calculations as to the animal produce of our county areas, and such an enumeration would help the solution of some of the general meat supply difficulties to which I have alluded. Districts of counties would of course require to be set out on a very careful and elaborate plan, as to soils and class of farming, and the acreage of each section carefully noted; due weight, and no more, being given to each case of peculiarity in production that disturbs the average level of a county. The work will cost some money no doubt, but I consider it would be money well spent, and I trust the matter will be seriously entertained by our statistical authorities, and the reproach which I have shown attaches to England among other nations in this one statistical particular promptly and finally removed.

TABLE A.—SCOTTISH PRODUCE STATISTICS. Abstract Statement of Yield and Weight of Crops in Counties and Districts, compiled from Highland and Agricultural Society's Reports to the Board of Trade, 1855.

Yield per Acre.							Counties and Districts.	Weight per Bushel.			
Mau- golds	Potatoes.	Turnips.	Beans.	Oats.	Barley.	Wheat		Wheat.	Barley.	Oats.	Beans.
Tons.	Tons.	Tons.	Bshls.	Bshls.	Bshls.	Bshls.	ABERDEEN.	lbs.	lbs.	lbs.	lbs.
10	6½	16	26	32	31	26	District 1	—	51½	39	—
—	5½	16½	27	30	32	28	" 2	—	54	40	—
13	5½	15	34	31	33	28	" 3	—	51½	40	—
—	6	15	24	32	32	28	" 4	61	52	40	—
12	6	16	20	33	38	30	" 5	59	52	40½	—
16½	5½	17½	30	32	38	27	ARGYLL.				
15	4½	15	26	26	25	16	District 1	64	50	39	50
16	5	15½	26	30	38	32	" 2	—	52	40	—
4	5	17	33	40	41	32	" 3	—	52	40	64
45½	5	14	14	24	29	—	" 4	60	50	37	60
—	7½	20½	—	23	27	—	" 5	—	—	—	—
—	3	5	—	30	—	—	" 6	—	52	40	—
—	5½	15	—	14	—	—	" 7	—	—	—	—
—	3½	9½	—	28	—	—	" 8	—	—	—	—
—	5½	18	—	24	—	—	" 9	—	—	37½	—
—	—	—	—	—	—	—	" 10	—	—	—	—
17	3½	15½	26	34	32	25	AYR.				
16	4½	18½	25	35	34	27	District 1	61	52	35	65
14½	5	17½	28	41	35	26	" 2	60	54	34	64
15	4	16	30	40	35	29	" 3	59	50	34	62
13½	4	17	28	43	33	24	" 4	59½	—	33¾	—
—	—	—	—	—	—	—	" 5	—	—	—	—
—	5	14½	32	30	37	28	BANFF.				
—	5½	13½	—	32	32	29	District 1	—	—	—	—
—	—	—	—	—	—	—	" 2	61	52½	40	—
18	7	12½	28	34	32	27	BERWICK.				
16	8½	13	25	37	33	27	District 1	61	52	41	—
—	—	—	—	—	—	—	" 2	60	52	40	—
16	5½	15½	24	33	38	30	BUTE AND ARRAN.				
11	4½	10½	22	25	35	25	District 1	61	53½	38	—
—	—	—	—	—	—	—	" 2	60	52	36	—
—	4	15½	—	35	32	32	CAITHNESS.				
—	4½	17½	—	32	30	34	District 1	60	49	38½	—
—	—	—	—	—	—	—	" 2	58	49	39	—
15	4½	17	29	33	32	28	CLACKMANNAN.				
13	6	18	27	34	32	27	District 1	61	52	39	61½
—	—	—	—	—	—	—	DUMBARTON	60	51	39	51
13	4	16	28	29	29	21	DUMFRIES.				
17	5	15	31	29	31	23	District 1	62	53	39	62
15	5	15	21	28	27	19	" 2	60	51	38¾	64
19	5	12	33	33	31	21	" 3	60	51	38	58
5	3	11	20	23	23	22	" 4	60	52	39	63
—	—	—	—	—	—	—	" 5	58	51	39	—
16	5½	17½	32	36	37	31	EDINBURGH.				
18	6½	18	35	41	40	31	District 1	61	53	40½	62
11	5	12	26	33	32	26	" 2	61	52½	40	63
—	—	—	—	—	—	—	" 3	—	—	—	—

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Yield per Acre.							Counties and Districts.	Weight per Bushel.			
Man- golds.	Potatoes.	Turnips	Beans.	Oats.	Barley.	Wheat.		Wheat.	Barley.	Oats.	Beans.
Tons.	Tons.	Tons.	Bshls.	Bshls.	Bshls.	Bshls.		lbs.	lbs.	lbs.	lbs.
10	5	12	23	28	33	24	ELGIN	63	55	41	—
							FIFE.				
14 $\frac{1}{2}$	5	16	25	30	34	25	District 1	62	53 $\frac{1}{2}$	40 $\frac{1}{2}$	63
15 $\frac{1}{2}$	5	14 $\frac{1}{2}$	30	34	35	27	" 2	61	52	40 $\frac{1}{2}$	—
12 $\frac{1}{2}$	5	14 $\frac{1}{2}$	28	35	33	24	" 3	61 $\frac{1}{2}$	52	40	62 $\frac{1}{2}$
9 $\frac{1}{2}$	4	15 $\frac{1}{2}$	29	33	33	25	" 4	60	52	40	62
							FORFAR.				
12	4	12 $\frac{1}{2}$	25	35	32	26	District 1	61	52	40	—
11 $\frac{1}{2}$	5 $\frac{1}{2}$	13	29	31	31	27	" 2	62 $\frac{1}{2}$	52 $\frac{1}{2}$	40 $\frac{1}{2}$	—
							HADDINGTON.				
11	5 $\frac{1}{2}$	14	27	37	37	26	District 1	—	—	—	—
9 $\frac{1}{2}$	6	14 $\frac{1}{2}$	29	41	37	24	" 2	—	—	—	—
14 $\frac{1}{2}$	7	16	32	54	44	29	" 3	—	—	—	—
17 $\frac{1}{2}$	6 $\frac{1}{2}$	17	32	57	43	32	" 4	62 $\frac{1}{2}$	53	42 $\frac{1}{2}$	65
21	7	15	30	48	42	26	" 5	61 $\frac{1}{2}$	53 $\frac{1}{2}$	41	—
29 $\frac{1}{2}$	8	15 $\frac{1}{2}$	29	47	46	30	" 6	—	—	—	—
							INVERNESS.				
8	4	10	24	26	32	25	District 1	—	—	—	—
11	3 $\frac{1}{2}$	16	20	25	26	22	" 2	61 $\frac{1}{2}$	53 $\frac{3}{4}$	41	—
12	4	15	20	28	28	24	" 3	62	54 $\frac{1}{2}$	41	—
—	4 $\frac{1}{2}$	14 $\frac{1}{2}$	—	30	—	—	" 4	—	—	39 $\frac{1}{2}$	—
—	6	16	—	29	37	—	" 5	—	—	42	—
—	4	17 $\frac{1}{2}$	—	21	20	—	" 6	—	—	38	—
—	2	6	—	9	—	—	" 7	—	—	—	—
—	3 $\frac{1}{2}$	14 $\frac{1}{2}$	—	13	—	—	" 8	—	—	—	—
—	3 $\frac{1}{2}$	12 $\frac{1}{2}$	—	13	—	—	" 9	—	—	—	—
12	6	16	33	33	33	30	KINCARDINE.....	61 $\frac{1}{4}$	52	39 $\frac{1}{2}$	60 $\frac{3}{4}$
16	4	13 $\frac{1}{2}$	23	31	30	29	KINROSS	58	52	40	—
							KIRKCUDBRIGHT.				
14 $\frac{1}{2}$	5	15	31	29	30	24	District 1	60	51	38	—
12	5	16 $\frac{1}{2}$	26	32	28	25	" 2	60	52	40	—
12	3 $\frac{1}{2}$	17	24	29	32	26	" 3	60	53	39	—
—	5	13 $\frac{1}{2}$	24	29	23	—	" 4	—	50	40	—
							LANARK.				
14	6	15 $\frac{1}{2}$	30	35	35	28	District 1	59	53	37	—
12	4	12 $\frac{1}{2}$	25	27	32	25	" 2	59	50	38	—
12 $\frac{1}{2}$	5	14	28	31	34	30	LINLITHGOW	61	52 $\frac{1}{2}$	40	64
16	4	11	24	26	32	25	NAIRN	63	55	41	—
							ORKNEY.				
—	5	12 $\frac{1}{2}$	—	32	—	27	District 1	—	46	38 $\frac{1}{2}$	—
—	5	14 $\frac{1}{2}$	—	35	33	24	" 2	—	—	—	—
—	5	17 $\frac{1}{2}$	—	22	—	—	" 3	—	—	—	—
7	4 $\frac{1}{2}$	14	14	34	31	27	PERBLES	60	52 $\frac{1}{2}$	40	—

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Tons.	Tons.	Tons.	Bshls.	Bshls.	Bshls.	Bshls.		lbs.	lbs.	lbs.	lbs.
14	5	14	25	31	28	28	PERTH.				
9	4	11	24	31	31	27	District 1	61 $\frac{1}{2}$	52	40	63 $\frac{1}{2}$
—	3	9 $\frac{1}{2}$	17	23	23	20	" 2	61 $\frac{1}{2}$	52 $\frac{1}{2}$	40	—
—	5	14	25	27	29	26	" 3	61	51	39	—
9 $\frac{1}{2}$	4	11	22	27	24	22	" 4	60 $\frac{1}{2}$	50 $\frac{1}{2}$	39	61 $\frac{1}{2}$
20	5	14	27	24	22	23	" 5	61	51	39 $\frac{3}{4}$	—
15	5	11 $\frac{1}{2}$	25	32	31	29	" 6	—	—	—	—
—	5	17 $\frac{1}{2}$	17	30	27	30	" 7	61	52 $\frac{1}{2}$	39	60
—	4 $\frac{1}{2}$	13	23	31	32	24	" 8	62 $\frac{1}{2}$	52 $\frac{1}{2}$	40	—
							" 9	61	52	40	—
							RENFREW.				
12	6	15	36	37	37	29	District 1	58	—	—	—
15	6	16	27	34	32	23	" 2	58	—	40	—
7	6 $\frac{1}{2}$	17 $\frac{1}{2}$	28	36	36	26	" 3	—	—	—	—
8	4	11	22	24	27	29	" 4	—	—	36	—
							ROSS AND CROMARTY.				
10	4 $\frac{1}{2}$	15	25	33	35	25	District 1	62	54	41	64 $\frac{1}{2}$
8	5	14	24	29	32	27	" 2	61	54	40	—
—	5	15	15	32	—	—	" 3	—	—	—	—
—	3 $\frac{1}{2}$	14	30	30	32	—	" 4	—	—	39	—
—	4 $\frac{1}{4}$	16 $\frac{1}{2}$	—	28	28	—	" 5	—	—	—	—
—	6	14	—	26	—	—	" 6	—	—	37	—
							ROXBURGH.				
12	7	14	30	40	36	28	District 1	61	51 $\frac{1}{2}$	40	63
—	7	11	26	35	30	26	" 2	60	52	39	—
10	6	14	35	39	32	26	" 3	60	53	40	61 $\frac{1}{2}$
14	4 $\frac{1}{2}$	12	30	36	31	24	" 4	60 $\frac{3}{4}$	51 $\frac{1}{4}$	39 $\frac{3}{4}$	63
8	4 $\frac{1}{2}$	12	24	32	30	23	" 5	61 $\frac{1}{2}$	52	40 $\frac{1}{2}$	—
5	4 $\frac{1}{2}$	14 $\frac{1}{2}$	28	32	30	29	" 6	61	53	39	—
—	4 $\frac{1}{2}$	12 $\frac{1}{2}$	—	32	27	—	" 7	—	49	38 $\frac{1}{2}$	—
—	6	16	17	38	34	31	SELKIRK	61 $\frac{1}{2}$	52	40 $\frac{1}{2}$	59
							STIRLING.				
—	5	13 $\frac{1}{2}$	27	33	33	27	District 1	—	—	—	—
—	5	14	23	28	27	27	" 2	—	—	—	—
							SUTHERLAND.				
—	4	14 $\frac{1}{2}$	30	30	—	—	District 1	—	50	40	—
—	6	14	—	26	32	—	" 2	—	53	36	—
—	4 $\frac{1}{2}$	13	8	31	34	28	" 3	—	—	—	—
—	3 $\frac{1}{2}$	21	—	38	34	37	" 4	60	54 $\frac{1}{2}$	41 $\frac{1}{2}$	—
							WIGTOWN.				
13 $\frac{1}{2}$	5	14 $\frac{1}{2}$	25	34	37	27	District 1	60	53	40	66
13 $\frac{1}{2}$	3	14 $\frac{1}{2}$	27	27	27	22	" 2	61	—	38	65

TABLE B.—WHEAT. *Estimates of Yield, in Bushels per Acre, in different Counties of England at various Periods.*

Counties in Groups.	1	2	3	4	5	6 7		8	9 10	
	Arthur Young in	McCulloch, from Board of Agriculture Reports,	Mr. Caird, in	Mark Lane Express,	Chamber of Agriculture Journal,	Royal Commission on Agriculture Reports.		Average of Seven Years, Mark Lane Express,	Inquiry of Farmer and Chamber of Agriculture Journal.	
	1770.	1800-16.	1850.	1861.	1870.	Average before	Crop of	1876-82.	Average of Twenty Years to 1882	Crop of 1882.
I. (a.) Cambridge	—	24	32	32.3	33.0	33.0	23.2	27.1	31.6	34.2
Suffolk	24	20	32	28.7	28.7	30.4	21.7	27.0	30.0	26.4
Essex	24	24	28	31.0	33.0	33.6	22.9	26.0	30.2	29.2
Herts	24	20	22	28.0	28.5	26.3	16.3	23.0	28.2	28.7
Beds	19	24	25	28.5	30.0	30.5	19.6	25.7	28.6	23.8
Hunts	18	24	32	29.0	32.5	30.5	20.2	26.0	30.5	27.0
(b.) Norfolk	24	20	32	33.5	31.1	31.6	22.0	28.0	31.5	31.5
Lincoln	21	24	26	31.0	32.7	31.6	19.6	23.0	29.0	27.0
East Riding	25	22	30	29.5	30.0	29.0	17.7	—	26.4	24.2
II. (a.) Kent	—	22	—	33.0	33.7	34.0	27.4	27.0	32.0	32.1
Surrey	—	20	22	27.0	28.0	28.0	22.2	28.2	29.0	27.3
Sussex	22	24	22	29.7	30.0	31.0	23.0	23.0	32.0	31.1
Hants	20	20	30	27.7	29.5	28.5	19.4	25.8	26.4	25.9
Berks	28	20	30	33.5	31.5	32.0	20.2	24.3	32.0	27.5
(b.) Notts	31	26	32	29.7	30.0	30.7	22.7	23.0	28.1	25.1
Leicester	—	20	21	29.7	31.0	33.0	17.3	26.6	29.0	27.4
Rutland	—	22	—	33.0	31.2	—	—	25.0	—	—
Northamtn.	23	22	28	32.5	32.2	32.5	20.4	25.6	31.3	26.4
Warwick	28	21	30	30.0	30.0	31.7	19.4	22.3	28.0	23.7
Oxford	26	20	25	31.0	31.0	36.0	19.0	25.3	30.1	25.9
Bucks	25	22	25	28.5	29.0	30.0	15.2	26.3	29.2	27.2
Middlesex	—	24	—	30.0	31.0	—	—	30.0	—	—
III. (a.) Shropshire	—	20	—	24.2	26.0	21.0	19.1	19.6	24.4	23.2
Worcester	—	22	—	29.2	30.0	—	—	26.8	29.0	24.8
Hereford	—	20	—	25.2	29.5	23.0	12.5	21.2	29.7	27.0
Gloucester	20	16	23	27.5	28.0	—	15.2	22.5	25.7	21.7
Wilts	20	20	26	28.7	29.0	28.0	19.0	24.5	27.0	23.7
Monmouth	—	18	—	—	29.0	—	—	22.7	25.4	23.0
Somerset	—	20	—	29.0	29.0	31.6	—	26.0	27.6	24.2
Dorset	20	16	21	29.7	29.0	30.7	18.3	24.0	28.8	25.3
Devon	—	25	20	22.2	21.5	24.6	23.2	20.7	21.9	19.0
Cornwall	—	24	—	23.7	25.0	29.7	14.1	24.0	29.6	23.8
IV. (a.) Northum-berland..	18	24	23	26.0	27.0	28.6	30.0	21.0	28.1	29.7
Durham	25	21	16	25.2	26.0	28.0	17.8	22.5	29.1	28.1
York, N. R.	21	22	20	29.5	30.0	28.0	19.0	22.0	27.1	21.7
„ W. R.	20	22	30	29.5	30.0	25.0	17.6	—	25.7	24.7
(b.) Cumberlnd.	23	20	27	—	29.0	—	—	29.2	22.7	21.3
Westmorlnd.	—	20	—	28.7	28.0	20.0	15.0	—	20.0	24.5
Lancashire	26	18	28	34.2	32.0	29.2	23.7	22.2	26.4	28.4
Cheshire	25	20	28	29.0	30.0	28.0	20.0	28.0	25.5	26.0
Derby	—	18	—	29.0	29.0	28.0	20.0	26.0	24.0	24.3
Stafford	23	22	28	28.5	29.5	29.9	18.0	19.4	24.0	22.7

TABLE C.—BARLEY. *Estimates of Yield, in Bushels per Acre, at Different Periods, in England and Wales.*

Counties in Groups.	McCulloch, from Board of Agriculture Reports,	Mark Lane Express.	Royal Commission on Agriculture Reports.		Average of Seven Years, Mark Lane Express.	Inquiry of Farmer and Chamber of Agriculture Journal.	
			Average before	Crop of		Average of Twenty Years,	Crop of
	1800-16.	1861.	1878.	1879.	1876-82.	1863-82.	1882.
I. (a.) Cambridge	36	41.0	37.4	26.2	34.7	37.5	41.3
Suffolk	22	35.5	37.0	24.4	35.7	36.3	34.6
Essex	32	40.0	39.9	24.0	33.0	38.0	37.8
Herts	32	35.5	33.0	19.2	30.4	37.0	37.3
Beds	32	35.5	32.0	21.0	27.7	33.0	31.4
Hunts	40	40.2	37.0	19.0	32.4	35.8	32.9
(b.) Norfolk	36	42.7	34.8	25.0	33.8	37.0	37.3
Lincoln	32	39.5	37.4	22.4	27.3	34.5	34.7
East Riding	36	39.5	35.0	25.0	—	35.0	30.2
II. (a.) Kent	32	40.5	43.0	36.6	36.0	40.5	41.0
Surrey	30	35.7	34.1	31.0	31.5	34.5	34.3
Sussex	32	41.7	37.0	26.7	28.0	36.4	39.6
Hants	30	36.5	34.0	28.3	31.0	32.8	28.7
Berks	32	41.7	36.1	25.0	29.3	37.6	33.0
(b.) Notts	38	41.7	36.7	27.6	26.4	34.4	33.0
Leicester	32	37.7	38.0	19.0	28.0	36.0	32.8
Rutland	32	43.2	—	—	34.0	—	—
Northamtn.	32	44.0	37.7	23.0	32.0	37.2	34.5
Warwick	28	39.5	34.7	18.4	28.2	31.7	30.0
Oxford	28	39.5	35.0	21.6	28.0	35.7	28.7
Bucks	32	37.7	28.0	24.0	31.3	36.4	32.0
Middlesex	32	37.5	—	—	39.0	—	—
III. (a.) Shropshire	28	29.0	—	—	21.8	26.6	27.3
Worcester	38	39.2	—	—	34.2	35.0	32.2
Hereford	30	32.0	24.5	16.0	25.5	33.2	33.6
Gloucester	24	34.5	—	—	31.0	32.2	29.2
Wilts	30	36.5	31.0	23.1	31.0	32.5	25.9
Monmouth	28	—	—	—	25.5	28.6	24.6
Somerset	28	36.0	37.3	—	33.5	35.1	32.5
Dorset	28	38.0	39.3	27.3	31.0	33.7	29.3
Devon	24	31.7	30.5	24.7	28.7	30.2	27.4
Cornwall ...	36	31.7	34.6	19.8	25.5	39.0	32.6
IV. (a.) Northum-berland... }	36	35.7	36.1	40.0	27.0	36.0	40.3
Durham	33	33.0	30.0	24.7	28.0	34.6	35.0
York, N. R.	36	39.5	36.0	23.0	—	34.7	27.0
„ W. R.	36	39.5	29.0	22.5	—	33.0	32.7
(b.) Cumberlnd.	36	—	36.0	27.0	25.6	35.0	35.4
Westmord	40	37.0	30.5	27.0	20.0	33.0	29.0
Lancashire	30	39.0	48.0	47.0	36.5	32.0	31.4
Cheshire	29	31.5	—	—	30.0	28.3	30.4
Derby	36	40.5	34.0	26.0	33.2	32.0	29.3
Stafford	36	35.7	36.0	20.0	29.2	30.7	26.0
North Wales	32	—	—	22.5	34.0	28.0	27.0
South Wales	34	—	30.2	19.1	27.0	27.5	28.0

TABLE D.—OATS. *Estimate of Yield, in Bushels per Acre, at Different Periods, in England and Wales.*

Counties in Groups.	McCulloch from Board of Agriculture Reports.	Mark Lane Express.	Royal Commission on Agriculture Reports.		Average of Seven years, Mark Lane Express.	Inquiry of Farmer and Chamber of Agriculture Journal.	
	1800-16.	1861.	Average before	Crop of	1876-82.	Average of Twenty Years, 1863-82.	Crop of
			1878.	1879.			1882.
I. (a.) Cambridge	32	59.5	58.0	53.6	48.7	56.6	68.6
Suffolk	36	47.0	46.7	43.0	46.0	55.4	48.0
Essex	36	51.0	50.8	34.0	44.7	44.7	48.4
Herts	36	44.2	42.3	35.0	39.8	47.0	52.6
Beds	32	47.7	40.8	32.0	37.8	41.5	37.6
Hunts	36	54.2	54.0	38.6	47.3	45.3	45.6
(b.) Norfolk	40	55.5	56.0	34.0	41.2	51.3	54.9
Lincoln	48	54.5	51.8	43.3	43.8	49.3	50.8
East Riding	44	51.0	51.0	48.6	—	48.3	49.6
II. (a.) Kent	36	53.0	58.3	48.8	45.7	51.0	58.9
Surrey	32	42.5	50.0	32.0	47.4	49.0	49.4
Sussex	40	51.0	44.6	46.0	37.7	52.0	61.4
Hants	32	47.5	45.0	45.5	43.8	40.4	49.2
Berks	32	56.0	54.7	54.0	37.7	53.0	56.0
(b.) Notts	36	52.0	44.8	37.0	37.0	38.4	42.7
Leicester	40	47.0	42.2	25.5	38.8	41.8	40.4
Rutland	44	53.0	—	—	39.8	—	—
Northamtn.	36	53.7	43.0	34.0	38.2	44.6	43.7
Warwick	40	49.0	—	—	36.0	38.0	40.4
Oxford	36	49.7	—	—	38.3	44.8	45.2
Bucks	32	48.5	45.3	—	33.3	47.0	44.7
Middlesex	36	57.2	—	—	50.6	—	—
III. (a.) Shropshire	24	31.5	—	—	23.6	29.8	33.2
Worcester	30	44.2	—	—	37.5	—	32.0
Hereford	32	31.2	—	—	29.8	37.0	40.0
Gloucester	20	40.7	—	—	37.0	41.2	38.7
Wilts	32	47.2	44.5	36.0	41.3	43.3	41.5
Monmouth	25	—	—	—	34.7	—	—
Somerset	32	44.0	—	—	39.2	41.6	43.5
Dorset	32	45.0	50.7	44.7	36.7	43.2	40.7
Devon	32	37.0	37.0	40.0	41.8	34.6	34.9
Cornwall	40	37.7	45.0	39.2	30.5	46.6	40.4
IV. (a.) Northum-berland..	40	40.7	52.8	80.0	30.8	37.2	41.0
Durham	36	41.0	36.0	34.7	37.5	39.3	41.9
York, N. R.	44	51.0	53.5	43.6	—	47.4	44.0
„ W. R.	44	51.0	39.0	39.0	—	36.1	39.2
(b.) Cumberlnd.	40	—	52.0	39.0	27.4	34.5	37.2
Westworld.	38	34.7	47.5	33.0	37.0	38.0	39.8
Lancashire	40	40.0	51.0	49.3	46.2	47.2	49.0
Cheshire	36	41.7	44.0	34.0	43.7	34.8	38.6
Derby	36	48.0	40.0	24.0	40.6	36.0	36.7
Stafford	36	40.0	—	—	30.6	37.3	41.7
North Wales	38	—	—	36.3	33.7	30.0	33.4
South Wales	39	—	35.0	28.0	32.0	37.4	36.4

TABLE E.—SCOTLAND. *Yield of Grain Crops, in Counties, in Bushels per Acre, at Different Periods.*

Counties.	Wheat.				
	Highland Society's Statistics.	"Farmer" Inquiry.	Highland Society's Reports.	"Farmer and Chamber of Agriculture Journal" Inquiry.	
	1857.	1867.	1881.	1882.	20 Years' Average.
<i>Southern Division—</i>					
Wigtown	24	28	18	26	—
Kirkcudbright	25	26	—	—	—
Dumfries	26	30	—	—	—
Roxburgh	26	—	—	—	—
Berwick	27	—	30	—	—
Selkirk	29	—	—	—	—
Peebles	27	—	—	—	—
Lanark	37	24	35	35	30
Haddington	27	33	36	35	31
Edinburgh	30	32	32	36	30
Linlithgow	31	—	—	—	—
Stirling	28	—	24	38	33
Dumbarton	32	31	26	—	—
Kenfrew	30	26	20	—	—
Ayr	29	30	39	—	—
Fife	28	26	24	32	32
<i>Northern Division—</i>					
Perth	26	24	36	29	29
Kinross	26	—	—	—	—
Clackmannan	29	20	—	—	—
Forfar	27	29	—	37	35
Kincairdine	30	—	—	28	29
Aberdeen	24	16	—	—	—
Banff	23	—	—	—	—
Elgin	27	29	24	38	32
Nairn	30	—	—	—	—
Inverness	24	29	24	28	32
Argyll	32	—	—	—	—
Bute	30	27	28	32	35
Ross	27	30	24	27	26
Sutherland	22	—	—	—	—
Caithness	28	—	—	—	—
Orkney and Shetland	22	—	—	—	—
Barley.					
<i>Southern Division—</i>					
Wigtown	31	32	32	31	—
Kirkcudbright	30	35	—	36	32
Dumfries	29	36	—	40	30
Roxburgh	35	—	28	28	30
Berwick	33	19	30	—	—
Selkirk	30	33	—	—	—
Peebles	33	33	32	40	38
Lanark	37	—	28	55	31
Haddington	38	48	36	37	38
Edinburgh	36	36	40	42	42
Linlithgow	34	—	14	—	—
Stirling	33	—	33	37	38
Dumbarton	32	28	28	—	—
Kenfrew	36	37	30	—	—
Ayr	33	44	44	40	36
Fife	32	35	32	35	30
<i>Northern Division—</i>					
Perth	31	36	37	35	34
Kinross	31	—	—	—	—
Clackmannan	35	28	—	—	—
Forfar	33	37	48	41	40
Kincairdine	34	33	—	38	41
Aberdeen	32	36	39	42	36
Banff	29	—	32	36	34
Elgin	35	37	32	38	32
Nairn	32	—	28	—	—
Inverness	29	35	36	34	28
Argyll	32	30	30	36	36
Bute	40	32	36	38	40
Ross	33	34	38	28	28
Sutherland	29	—	—	—	—
Caithness	31	—	32	28	33
Orkney and Shetland	31	—	—	10	35

TABLE E. SCOTLAND. Yield of Grain Crops, in Counties—Contd.

Counties.	Oats.				
	Highland Society's Statistics	"Farmer" Inquiry.	Highland Society's Reports.	"Farmer and Chamber of Agriculture Journal" Inquiry.	
	1857.	1867.	1881.	1882.	20 Years' Average.
<i>Southern Division—</i>					
Wigtown	31	40	35	36	—
Kirkcudbright.....	32	51	—	35	32
Dumfries	33	42	37	50	35
Roxburgh	39	—	29	32	33
Berwick	39	50	36	—	—
Selkirk	38	38	27	28	25
Peebles	32	39	34	44	40
Lanark	37	39	43	44	40
Haddington	45	53	43	53	48
Edinburgh	35	47	50	48	—
Linlithgow	34	—	14	—	—
Stirling	31	—	40	50	45
Dumbarton	35	36	46	—	—
Renfrew	37	39	40	36	—
Ayr.....	42	42	50	44	42
Fife	37	47	42	45	45
<i>Northern Division—</i>					
Perth.....	35	43	38	39	38
Kinross	37	—	—	—	—
Clackmannan	38	28	—	—	—
Forfar	38	46	48	51	45
Kincardine	37	37	—	44	43
Aberdeen	33	37	38	40	32
Banff.....	30	—	33	40	38
Elgin.....	32	44	36	40	30
Nairn.....	32	—	28	—	—
Inverness	29	43	33	47	41
Argyll	35	30	33	33	33
Bute	35	37	34	42	44
Ross	33	39	32	34	32
Sutherland	32	27	—	—	—
Caithness	29	40	30	28	30
Orkney and Shetland.....	31	—	32	32	30

TABLE F.—Yield of Crops in different Geological Areas in England as ascertained by the "Farmer" for the Year 1867.

Area.		Wheat	Barley.	Oats.	Beans.	Peas	Pota- toes	Tur- nips.	Swedes.	Man- golds.
I. Drift	Marshlands, gravel, &c.	28·0	38·0	50·2	29·5	26·0	4·0	14·7	14·6	23·0
II. Tertiary	Crag, sands, clay, &c.	29·3	38·7	53·0	29·1	28·0	6·3	16·2	14·4	20·4
III. Cretaceous	Chalk, greensand, &c.	26·5	39·3	53·4	26·8	22·4	10·2	16·1	16·7	21·3
IV. Wealden	{ Clay, &c., Kent and Sussex	21·1	28·2	35·7	24·2	24·4	3·5	10·7	19·4	23·0
V. Oolite & Lias	Clays, sand, &c.	23·9	35·6	43·8	25·6	27·1	4·4	17·1	18·4	22·9
VI. Trias	New red sandstone, &c.	23·5	33·9	39·2	28·4	23·3	6·2	14·7	15·0	23·3
VII. Permian	Lower do.	21·9	34·4	40·2	30·0	18·2	4·4	13·2	15·1	18·4
VIII. Carboniferous	{ Coal measures, lime- stone, &c.	25·9	35·3	42·1	30·5	19·3	5·8	17·1	19·2	18·7
IX. Devonian	Old red sandstone, &c.	21·0	29·6	34·8	—	16·0	3·9	18·3	18·6	18·1
X. Silurian and Cambrian	Slate and granite	22·6	27·2	32·8	25·0	20·0	5·0	13·4	15·4	14·2
Appendix	{ English Reports re- ceived too late to group	27·2	37·0	42·8	28·8	30·8	5·6	14·6	17·6	25·1
Wales	—	21·7	28·2	27·9	—	20·0	6·0	16·7	16·7	17·0
	Mean of above averages	24·4	33·7	41·2	27·7	22·9	5·3	15·1	16·9	20·0

TABLE G. —Counties represented in the different Geological Areas of the above Inquiry.

Counties.	I. Drift.	II. Tertiary.	III. Creta- ceous.	IV. Weal- den.	V. Oolite and Lias.	VI. Trias.	VII. Per- mian.	VIII. Carbon- iferous.	IX. Devonian.	X. Silurian and Cambrian.	Mean of County.
Cambs	30	—	29	—	—	—	—	—	—	—	29'5
Suffolk	—	29	26	—	—	—	—	—	—	—	27'5
Essex	—	30	—	—	—	—	—	—	—	—	30'0
Herts	—	—	26	—	—	—	—	—	—	—	26'0
Beds	—	—	—	—	30	—	—	—	—	—	30'0
Hunts	—	—	—	—	24	—	—	—	—	—	24'0
Norfolk	33	32	28	—	—	—	—	—	—	—	31'0
Lincoln	30	—	26	—	26	—	—	—	—	—	27'3
York (E. Riding)	—	—	—	—	—	—	—	—	—	—	—
Kent	—	30	27	20	—	—	—	—	—	—	25'7
Surrey	—	33	—	—	—	—	—	—	—	—	33'0
Sussex	—	32	—	21	—	—	—	—	—	—	26'5
Hants	—	20	—	—	—	—	—	—	—	—	20'0
Berks	—	—	24	—	27	—	—	—	—	—	25'5
Notts	—	—	—	—	—	22	—	—	—	—	22'0
Leicester	—	—	—	—	—	32	—	30	—	—	31'0
Rutland	—	—	—	—	20	—	—	—	—	—	20'0
Northampton	—	—	—	—	24	—	—	—	—	—	24'0
Warwick	—	—	—	—	—	26	—	—	—	—	26'0
Oxford	—	—	—	—	23	—	—	—	—	—	23'0
Bucks	—	—	28	—	23	—	—	—	—	—	25'5
Middlesex	—	—	—	—	—	—	—	—	—	—	—
Shropshire	—	—	—	—	—	23	—	—	—	—	23'0
Worcester	—	—	—	—	24	27	—	18	—	—	23'0
Hereford	—	—	—	—	—	—	—	—	21	25	23'0
Gloucester	—	—	—	—	22	—	—	—	—	—	22'0
Wilts	—	—	16	—	—	—	—	—	—	—	16'0
Monmouth	—	—	—	—	—	—	—	—	—	—	—
Somerset	—	—	—	—	25	—	—	—	—	—	25'0
Dorset	—	—	24	—	24	—	—	—	—	—	24'0
Devon	—	—	—	—	17	18	16	20	20	19	18'3
Cornwall	—	—	—	—	—	—	—	—	17	—	17'0
Northumberland	—	—	—	—	—	—	—	28	—	—	28'0
Durham	—	—	—	—	—	24	23	21	—	—	22'7
York (N. Riding)	—	—	—	—	20	22	—	—	—	—	21'0
York (W. Riding)	22	—	—	—	—	22	24	32	—	—	26'0
Cumberland	—	—	—	—	—	25	—	26	—	—	24'0
Westmorland	—	—	—	—	—	18	15	—	—	—	16'5
Lancashire	25	—	—	—	—	30	—	27	36	—	34'5
Cheshire	—	—	—	—	—	—	—	37	—	—	37'0
Derby	—	—	—	—	—	24	—	—	—	—	24'0
Stafford	—	—	—	—	—	25	—	18	—	—	21'6
Mean of Geological Areas	28	29'4	25'4	20'5	23'5	24'3	20'8	25'7	23'5	22	—

Note.—The means of the several geological districts when worked out as in this table, on the average of the counties named as furnishing reports in each class, will not exactly agree with the means as worked out in the foregoing table, in which an average of the whole reports from each geological area is striking. The arithmetical mean of the ten areas thus averaged stands at 24'3 as against 24'4 in the other table. To the mean of each county no great importance can be attached, as the number of reports in many cases is insufficient.

TABLE H.—Showing the (1) Total Cultivated Area; (2) the Total Acreage of all Corn Crops, and of Wheat, Barley, and Oats in each County in England, on the Average of the Ten Years 1872-81.

	Total Cultivated Area.	Total Corn Crops.	Wheat.	Barley.	Oats.
	Acres.	Acres.	Acres.	Acres.	Acres.
England	24,253,999	7,304,558	3,006,716	2,030,143	1,466,677
Wales	2,715,858	505,440	104,373	152,479	240,049
Scotland	4,649,925	1,409,699	93,962	262,101	1,018,151
Total—Great Britain	31,619,782	9,219,697	3,205,052	2,444,723	2,724,877
Bedford	258,242	115,136	50,376	32,089	10,170
Berks	372,053	146,385	59,376	39,612	26,977
Bucks.	402,056	132,150	54,613	29,769	25,772
Cambs.	482,946	257,615	125,079	64,173	34,495
Chester	525,589	82,613	27,849	3,293	45,959
Cornwall	532,391	143,820	47,369	52,197	44,031
Cumberland	556,030	97,119	18,565	7,989	69,505
Derby	504,682	70,293	26,695	14,063	26,855
Devon	1,107,665	287,867	118,330	75,385	90,957
Dorset	478,149	111,875	42,643	39,394	22,108
Durham	411,379	93,269	34,010	19,466	35,442
Essex	824,151	404,127	177,390	113,697	39,823
Gloucester	647,783	172,062	87,550	42,403	18,477
Hants.	701,673	253,106	105,231	62,667	66,804
Hereford	437,440	106,766	55,476	22,833	12,971
Herts.	337,223	147,029	61,353	46,114	25,697
Hunts.	208,881	99,280	44,948	25,064	11,653
Kent	733,262	239,137	100,283	46,092	51,098
Lancaster	765,098	101,196	30,779	10,113	53,799
Leicester	470,175	104,770	39,729	31,925	21,498
Lincoln	1,478,740	622,079	281,771	181,060	97,525
Middlesex	116,590	18,759	8,043	2,448	4,903
Monmouth	233,640	38,387	18,018	10,260	8,223
Norfolk	1,072,075	451,806	194,407	194,704	29,596
Northampton	557,049	179,265	74,973	57,219	20,079
Northumberland	688,761	134,914	28,191	40,231	59,637
Notts.	446,452	157,863	68,121	49,467	21,613
Oxford	414,968	163,938	59,808	51,661	25,267
Rutland	85,644	26,275	9,216	11,195	3,711
Salop	698,399	168,722	77,623	53,462	26,434
Somerset	837,391	142,547	69,180	33,617	22,029
Stafford	594,336	115,258	49,156	28,884	29,639
Suffolk	768,869	382,810	146,791	147,883	15,239
Surrey	298,402	95,172	41,039	17,401	25,780
Sussex	659,722	204,651	94,465	22,600	65,608
Warwick	486,318	142,693	68,603	27,790	16,744
Westmorland	241,149	20,257	1,381	2,641	16,010
Wills.	745,836	217,833	92,602	67,230	36,011
Worcester	393,984	118,317	61,558	19,990	8,445
Yorks., E. Riding	670,554	278,514	103,715	73,056	76,734
„ N. Riding	831,276	220,199	61,399	77,332	67,154
„ W. Riding	1,176,903	237,860	88,617	76,108	56,706

TABLE I.—Percentage of Cultivated Area occupied on the average of the Ten Years 1872-81, by—

	Corn Crops.	Wheat.	Barley.	Oats.	Rye. Beans. Peas.
England	30'12	12'4	8'37	6'05	3'30
Wales	18'61	3'85	5'61	8'84	0'31
Scotland	30'31	2'02	5'63	21'90	0'76
Total—Great Britain	29'16	10'14	7'73	8'61	2'68
Bedford	44'58	19'50	12'42	3'93	8'70
Berks	39'34	15'96	10'65	7'25	5'48
Bucks.	32'94	13'58	7'40	6'41	5'55
Camb.	53'34	25'90	13'29	7'14	1'05
Chester	15'72	5'30	0'63	8'74	7'01
Cornwall.....	27'01	8'90	9'80	8'27	0'04
Cumberland	17'46	3'34	1'43	12'50	0'19
Derby	13'93	5'29	2'79	5'32	0'53
Devon	25'99	10'68	6'81	8'21	0'29
Dorset	23'40	8'92	8'24	4'62	1'62
Durham	22'70	8'27	4'73	8'62	1'08
Essex	49'04	21'52	13'80	4'83	8'89
Gloucester	26'56	13'51	6'55	2'85	3'65
Hants	36'11	15'00	8'93	9'52	2'66
Hereford.....	24'40	12'68	5'22	2'96	3'54
Herts	43'60	18'20	13'67	7'62	4'11
Hunts.....	47'53	21'52	12'00	5'58	8'43
Kent	32'61	13'67	6'29	6'97	5'68
Lancaster	13'22	4'01	1'32	7'03	0'86
Leicester	22'28	8'45	6'79	4'57	2'47
Lincoln	42'07	19'05	12'45	6'60	3'97
Middlesex	16'10	6'90	2'10	4'20	2'90
Monmouth	16'43	7'71	4'39	3'52	0'81
Norfolk	42'14	18'14	18'16	2'76	3'08
Northampton	32'17	13'46	10'27	3'60	4'85
Northumberland	19'60	4'10	5'84	8'65	0'56
Notts.	35'36	15'26	11'08	4'84	4'18
Oxford	39'50	14'43	13'03	6'09	5'95
Rutland	30'68	10'76	13'07	4'34	2'51
Salop	24'16	11'12	7'66	3'78	1'66
Somerset	17'02	8'26	4'01	2'63	2'12
Stafford	19'40	8'27	4'86	5'00	1'28
Suffolk	49'79	19'10	19'23	1'98	9'48
Surrey	32'00	13'75	5'83	8'64	3'78
Sussex	31'02	14'31	3'42	9'95	3'34
Warwick.....	29'34	14'11	5'71	3'44	6'08
Westmorland	8'40	5'6	1'10	6'64	0'10
Wilts	29'20	12'41	9'01	4'83	2'95
Worcester	30'03	15'63	5'07	2'14	7'19
Yorks., E. Riding	41'53	15'47	10'89	11'44	3'73
" N. Riding	26'49	7'39	9'30	8'08	1'72
" W. Riding	20'21	7'53	6'47	4'81	1'39

DISCUSSION *on* MAJOR CRAIGIE'S PAPER.

MR. W. J. HARRIS said he was glad that Major Craigie had referred to the estimate of the value of British agricultural produce made by Sir James Caird for the Royal Agricultural Society in 1878, and he wished that Major Craigie had found time to have supplemented his most valuable paper with a fresh estimate of his own making. Although he considered that the individual items were pretty correctly valued at the time by Sir James Caird, yet he regarded them as giving a result wanting in correctness when taken collectively. Major Craigie had hinted that the results of Sir J. Caird's calculations did not agree with his own, and it must be evident to all that it was a most incorrect plan to take the value of each agricultural product alone, and then to add them all together, without considering what became of the different articles before they were ultimately sold. Agriculture was in truth a manufacture, and before meat could be produced a certain number of other articles must be used to produce it. And not only were large quantities of our own corn and hay crops used for this purpose, but also a number of foreign materials were bought by farmers and used in like manner. None of these things had been taken into account by Sir J. Caird, but he had just valued the total quantity of meat sold as being the production of our own soil. He must admit that there were likewise some items on the other side which Sir J. Caird might properly have added to his estimate. Major Craigie had already mentioned poultry as one of these omissions, and the number of horses which our farmers sold every year for non-agricultural purposes must be taken as another. He believed that this latter amount might be approximately arrived at by taking the number of non-agricultural horses existing in the United Kingdom, and giving them an average life of about seven years from the date of their purchase. If this estimate of their average life were correct, the number sold could be easily arrived at, and he imagined it would exceed 100,000—worth, possibly, 4 million pounds. As to the horses used in agriculture, they could not be reckoned as any gain, as they were necessary to the business, and their purchase or breeding and keep formed part of the expenses of agriculture. The only reliable estimate of the produce of British agriculture would be derived from what the farmers actually had for sale. The total estimate of Sir James Caird amounted to 260 million pounds for the three kingdoms, but judging by the Gazette returns it was evident that farmers had very few oats for sale. It was, therefore, quite evident that the oat crop could not be valued as an asset at one-fifth part of its produce. The same observation would apply to barley. He did not believe that more than half the barley crop was sold, or that more than four-fifths of the potato crop was sold. He very much doubted whether the total

production of the United Kingdom was so much as 200 million pounds, or for England and Wales alone more than 140 million pounds. Taking this latter figure as the production of England and Wales alone, would give us the means of ascertaining pretty correctly the proportion which the burdens of agriculture bore to what the agriculturist had to sell. Including tithes, imperial taxation, and local rates, the burdens on agriculture in England and Wales amounted to about 14 million pounds per annum, or about 10 per cent. on the receipts. It therefore appeared to him that notwithstanding our system of free trade which many so much admired, we were in fact protectionists against ourselves in the matter of agriculture. It was maintained by some that tithes were a charge on the landowner, and so they might be now, but it was not so before the repeal of the corn laws. Before the commutation in 1836, if anyone took a piece of uncultivated land, there was no tithe belonging to it at all, but directly he cultivated it he was tithed according to the produce, and in selling the produce he had to calculate the tithe and all other burdens as part of the cost. Since the repeal of the corn laws, all these charges had been gradually transferred from the consumer to the producer. Before then prices would be fixed by the process of competition of farmers among themselves; but since then the price had been fixed by competition with the American farmers, who had no tithes and very small taxes to pay; therefore Englishmen were handicapped to this extent. Moreover, the American agriculturist farmed with a view to exhaust his soil, and then move on, but land here was farmed with a view to maintain its fertility. As Major Craigie told us, the yield of corn per acre at the commencement of this century was less than now, which showed conclusively that it had been managed on principles which maintained its producing value. Mr. Chamberlain had admitted that agriculture was our most important manufacturing industry. As a natural sequence he must admit that the land was the raw material, and it seemed quite absurd with the free trade notions which were generally held here that the raw material should be taxed at all. It was said that all abatements would go to the landlords; but he thought this an unreasonable supposition, unless it could be proved that agriculture was in a very prosperous state, and then probably landlords might be able to gain some benefit from the remission of taxes. As it was, the labourers and tenants would both claim to live differently to what they had done in the past before the landlord would receive any benefit. Rent simply meant the interest of money laid out in buildings, draining, fencing, and other operations with a certain prairie value added, which varied with the quality of the land. He knew of hundreds of farms which could not now be produced at to-day's price of labour for the capitalised value of the rent, let alone any value for the land itself. A month or two since a farm of nearly 500 acres, situated in the West of England (which he knew very well), was sold at four and three quarter times the tithe multiplied by thirty years' purchase. In 1842 the same farm had been sold for seven times the tithe multiplied by thirty years' purchase. Soon after 1842 the rent had been raised

to eight times the tithe. The farm had been tenanted by one family for over one hundred years. In 1879 their lease came to an end, and they left the farm, and it had recently been sold at the very low price he had mentioned. This showed how very unfairly a fixed charge fell on land. He did not wish to argue against the Established Church receiving her legal revenues, but he could not see why this one industry should bear the brunt of it. Foreign competition had only gradually produced these results, firstly, the Crimean war had interfered with Russian supplies, and, secondly, the American civil war had prevented the full development of their productive forces for many years; but now the competition was upon us in all its force for corn, and he ventured to predict that before long it would be equally severe in regard to meat, or perhaps more so. Looking at results for the last twenty years, it would be interesting to note the decline in prices. Thus in 1860-62, the average price of wheat was 54s. 10d.; of barley, 33s. 5d.; and of oats, 23s. 7d.; while for the three years comprised in 1880-82, the average prices were as follows:—wheat, 44s. 11d.; barley, 32s. 1d.; and oats, 22s. 3d.: so that there had been a very important decline in all three articles, showing that the burdens on agriculture had been shifted from the consumer to the producer. He maintained that prosperity would not return to agriculture until there was an entire revolution in the incidence of taxation. It had been recommended that farmers should turn their land into pasture, but however much landlords might think this to their own interests, he believed that such a proceeding was bad for the country, as it reduced by one-half our producing power; and moreover, when poor land was treated in this way, it was apt to increase the tendency to liver fluke among the sheep pastured upon it. This disease, as all knew, had been a great scourge for many years past.

MR. CLARE SEWELL READ said the previous speaker had quite astonished him by the doctrines which he had advanced, which savoured more of a farmer's club than this learned Society. He considered that free trade had nothing whatever to do with the alteration of the tithes, which were commuted some twelve or fourteen years previously. If legitimate estimates of the yield of grain and the produce of meat and wool could be obtained, they would be exceedingly useful. Suppose he (Mr. Read) grew on an average 200 acres of wheat a year. In the year 1874 he had 6 quarters an acre all round; in the years 1879 to 1881 the produce was only $3\frac{1}{2}$ quarters. In some exceptional years he might increase the quantity by 30 acres or decrease it by 30 acres, and the result between the greatest amount of acreage, estimating the average yield at 4 quarters, and the smallest amount of acreage, would be something like 240 quarters, whereas the difference between a very good crop and a very bad crop, even in a light land county, would be something like 500 quarters. A good reliable estimate of the yield was therefore really a matter of more importance than the variety of area under crops in different years. What had been said by the last speaker with regard to the produce of arable as com-

pared with pasture land, referred more to the eastern and corn growing districts than to the western and some of the midland districts. No doubt in Norfolk an acre of arable land would yield double the quantity of produce than an acre of grass land would do, but at the same time if the farmers there found it more profitable to produce the lesser quantity, the country had no business to say to them, "You ought to grow corn;" they must grow what they could sell, even if it was a loss to the nation, provided it was the best thing for themselves. It was generally supposed that acreage statistics were very accurate, and he believed they were fairly so, but from a rather extensive knowledge of the collection of such statistics in a district where there was a great number of small farmers, he could say that the difference in the way in which farmers filled up the returns was somewhat remarkable. A good many guesses were made at the acreage of corn and other crops, and there were different methods of calculation adopted even by people who were supposed to know much better. For instance, he had known farmers go to the schedule which was generally attached to the lease, take the number of acres of the different fields, add them up, and say, "There is so much wheat and so much barley," forgetting the fact that in all probability that acreage represented, in small enclosures, from 10 to 15 per cent. more than the actual acreage that was under crops in consequence of roads, fences, and ditches, being included, and so on. On the other hand, some small farmers would take their fields of 10, 6, and 4 acres, add them together, and make them 20 acres, whereas in all probability if the different quantities had been accurately ascertained, the 10, 6, and 4 acres would make 21 or even 22 acres. There was therefore a difficulty at arriving at an exact acreage. He hoped that that would be gradually overcome by a more intelligent view being taken by farmers in making up their returns. It was quite true that a check had been given to the advance of production by the unremunerative crops of the last few years. Up to 1870 or 1874 agriculture prospered pretty fairly, but since then the country had passed through such a period of depression that the average yield was greatly diminished, and he feared that it would continue to diminish. Good seasons would no doubt come again, but farmers might not be in a position to take advantage of them. The land was not now in a state to produce its former good crops. The farming interest was now so poor and the land so foul, that come what may, no very great crop of corn could be grown in England for many years to come.

Mr. S. B. L. DRUCE joined with Major Craigie in expressing his regret that the statistical information which the Royal Commission had afforded was not more complete and comprehensive than it is. So far as the Assistant Commissioners for England, of whom he was one, were concerned, they met together and arranged two tables, by the first of which they hoped to obtain accurate statistical information of the average production of wheat, barley, oats, peas, beans, hay, straw, roots, including potatoes, flax, and hops. By the second table they hoped to obtain the cost of the production of each crop. He was happy to say that from some parts of his district, which

comprised fifteen eastern and eastern-midland counties, he received very complete and accurate returns, but the whole of them were not printed in the reports, and therefore the statistical results of the inquiry were not so comprehensive as they might have been. When Major Craigie showed him the returns he had taken out from the published reports he (the speaker) was astonished, and saw at once that the results were wrong as applied to several of his counties. He immediately applied himself to the inspection of his manuscript returns, and he found that many of them had not been printed in the published reports. From the largest county included in his district, namely Lincolnshire, he received a great number of returns both of the production of the crops and of the cost of their production. From Suffolk and Cambridge he also had a fair number, but from Derbyshire he had only about four returns. The difficulty lay in getting the returns from the smaller farmers. Now-a-days the large farmers conducted their farms as men of business conducted their businesses. Some of them kept not only good books and good accounts, but a clerk or a well instructed bailiff or assistant to do the tabulating for them; but an ordinary farmer, who was often not very well educated, and who was out in the fields all day long, was too tired at night to make the returns, and perhaps scarcely able to make them, however simple they might be. Even within the last year or two farmers had said to him, "What is the good of making returns; they do no good to me?" and others had said, "It is only a dodge to put up our rents, or to raise the taxes and rates." In this respect, however, he thought matters were decidedly improving, but still too much reliance must not be placed on the agricultural returns for some years to come.

Mr. EDMUND J. MOFFAT, European agent of the United States Department of Agriculture, said that in America, where the prices were affected by dealings in "futures" and by "corners," it was most important that accurate agricultural returns should be obtained. For that purpose the Government some years ago established an Agricultural Bureau of Statistics. The work had progressed slowly, but year by year Congress saw the necessity of it, and last year an appropriation of 16,000*l.* was given towards it. The States were accurately mapped out; every correspondent in a particular county was known, and so they knew to whom to apply for every information that was required. The reports were made monthly, printed slips being sent out to the correspondents containing minute directions as to how to proceed with regard to particular crops in the neighbourhoods. They now had 3,000 correspondents, and for special crops like cotton, probably 400 or 500 made their report regularly on a particular day. When the reports were received, a large number of skilled clerks at once digested their contents, which were afterwards published. Of course they claimed no nearer approach to accuracy in these matters than could be secured anywhere else with the same amount of care and labour. For his own part he never believed that statistics were specially accurate simply because they happened to be baptised "official."

Mr. CLARE SEWELL READ asked if the correspondents were remunerated in any way in the United States.

Mr. MOFFAT said they received seeds from the experimental farms and all the agricultural publications of the Government. The only correspondents paid were the lately appointed special State agents.

Mr. H. MONCREIFF PAUL, before making any comments on the interesting paper which Major Craigie had read, desired to offer a few observations on the remarks which had fallen from his friend Mr. Harris. The freight and charges on shipments of wheat from other countries to England were a sufficient protection to British farmers without levying any duties on imported wheats. The exhaustion of the soil to which allusion had been made was a natural consequence in all new countries of overtaking the powers of virgin soil, which was too frequently regarded as being practically inexhaustible. The production of wheat in Russia had not permanently declined since the Crimean war, it simply ebbed and flowed like that of other countries. In proof of this it might be stated that while in the year 1878 wheat and wheat flour to the extent of 2,084,522 quarters were imported from Russia into Great Britain; in 1882 there were 2,208,699 quarters; but midway between 1878 and 1882 the importations dropped to 664,640 quarters. Mr. Harris had remarked that the burden of taxation had been shifted in England from the consumers to the producers in consequence of the adoption of free trade; but the fact was that the producers were themselves consumers of a great many articles which in consequence of free trade they could obtain at lower prices in common with the other inhabitants of the country; so that while they appeared to lose with the left hand they gained much more with the right. He did not agree with Mr. Harris that the turning of arable into pasture land was the cause of an increase of disease among sheep. Fluke and kindred diseases depended first on the geological formation, and secondly upon the seasons. If the geological formation were such as to produce a saline soil there would be no disease. As a practical instance, he might add that on much of the pastoral land in Australia sheep had been kept constantly on it for years and years without any sign of disease, whether the season was wet or dry. Having regard to the reason assigned by Major Craigie for his inability to complete the various sections of his paper, it would not be fair to criticise it too closely. Turning however to what had been said about the records in the colonies of agricultural and pastoral statistics, he would simply say that in such cases the statistics were freely given; they were regarded as an advertisement of what could be done there, and therefore there was no reticence on the part of farmers in giving the returns. Besides this, in many of the Australian colonies a tax was laid upon the occupiers or tenants of Government lands in proportion to the stock it carried, and therefore of necessity stock returns must be made year by year by the squatters. He thought Major Craigie was perfectly right in the remarks he made when dealing with the relative importance

of wheat as compared with other cereals. Where in Great Britain wheat was chiefly grown, it was because the climatic influences were there most favourable. In many places in Scotland where wheat was formerly cultivated it was not grown now because it does not pay, and it was found much more profitable to give attention to other crops. The higher the latitude at which wheat could be grown the better, provided there was plenty of sun and not too much rain, and this position was justly established in the diagrams exhibited that evening. He had gathered some independent statistics from various sources with regard to British wool, and he found that his figures were very much in accord with those of Major Craigie. His calculation was that the home clip of wool in the year 1876 was 155,800,000 lbs., the product of 28,182,951 sheep, or an average of 5'52 lbs. per head clipped. In 1882 130 million lbs. were clipped from 24,318,778 sheep, or an average of rather less than 5'34 lbs. per head. Thus in seven years the home clip had decreased 25,800,000 lbs., and the sheep nearly 4 millions. The peculiarity with regard to this result was that while there had been a decrease in the clip, there had been an actual increase in the exports of the home wool during the period under review. Thus in the year 1876, according to the customs returns, the exports were 9,823,176 lbs., while in 1882 they were 13,879,200 lbs., or an increase of 4,056,024 lbs. This increase was caused by the continued depression of trade in the Bradford district, in consequence of which the domestic wool had been taken more freely by foreign manufacturers. In treating of foreign produce statistics, Major Craigie had not dealt with colonial statistics, but he would commend to his notice Mr. Hayter's "Statistical Handbook of Victoria," in which were included those relating to the other Australian colonies and New Zealand. Those colonies had in 1881 74 million sheep, and 7 million acres of land under cultivation, of which 3,392,000 acres were under wheat, producing nearly 4 million quarters, and were therefore, he thought, entitled to find a place in the paper before it became incorporated in the *Journal* of the Society.

Mr. S. BOURNE said it was impossible to overestimate the advantage of these statistics, even though they were not absolutely accurate. The great value of such information was comparative, and though any particular year might not be exactly correct, yet unless there was reason to suppose that the other years with which it was compared varied in the extent of inaccuracy, the value of the statistics was exceedingly great. Still, the proper course was not to resist improvements, because they rendered comparison difficult, but to make allowances for inaccuracies when dealing with the facts brought before them. He trusted that Major Craigie's paper, coupled with the remarks as to the appointment of a minister of agriculture, would have some effect in increasing the amount of information upon the points dealt with in the paper. England had now no alternative but to go on with free trade, because with such a growing population an increased amount of food was required, and if it was not grown at home it must be obtained from abroad. The increased population could not be

profitably employed in the cultivation of the soil, and if retained in the country at all they must engage in the manufacture of articles to be sold abroad. The imports of foreign food during the past year compared with those of last year, showed some facts which bore very much on the importance of obtaining information with regard to what was taking place at home. The importation of the principal articles of animal food in the last year amounted to 44 million pounds in value, which was 3,500,000*l.* below the importation of the previous year. This bore out the argument that there was a difficulty in the importation of meat from abroad, which drove the agriculturist at home to the production of meat. If such a production was more profitable to the agriculturist than corn, it could not be injurious to the prosperity of the country. Concurrently with the diminution of the value of imported food there had been an increase in the cost of it: so that the real diminution, if estimated according to the quantity, was fully equal to 10 per cent. Side by side with that there had been an increase of 5 million pounds in the importation of vegetable food, or an increase of 5 per cent. No doubt this arose in a great measure from the deficiency in the American crop of Indian corn. That also explained the great increase in the production of barley and oats, which supplied the place of Indian corn in feeding stock.

Mr. STEWART (J.P. for Banffshire) said that he owned a moderate extent of land in one of the northern states of America, the ploughing alone of which was easier than that of most grass land in England, giving the American farmer a great advantage over his English competitor, even though the question of taxation was entirely left out. But under the head of taxation the British farmer was most severely handicapped, for the land burdens were excessively heavy. As regards freights, it was a remarkable circumstance that within a few miles of a railway station in Kent there was a considerable district of good wheat land, but the charges for carrying the wheat to the London market were actually greater than those to bring the wheat from Chicago. When the incidence of taxation on land was spoken of, it should be remembered that when heavy burdens were put on a fertile district in a rich parish they did not form a very large amount, proportionately, of the rental or produce of that parish; but in the poorer districts of Scotland they were enormous, and had the effect of driving the land out of arable cultivation into grass, which was neither good for the employment of the labouring classes nor for the general production of the country. A large rate on a poor district fell with crushing severity, while in a rich district it was a comparatively trifling matter. Two-fifths of the farmers of Haddingtonshire had migrated to Ireland in the last few years, and Lord Elcho had stated that in one parish the school rates alone were something like 1*s.* 10*d.* in the pound, while in another parish in the same county they only amounted to a few pence. It was a rich parish in which those rates were small, and a poor parish in which they were heavy. The confusion about tithes being or not being a burden on the land arose from the fact that people made too many

distinctions between occupier and landowner. In his opinion, it was the cost of the produce which was enhanced by these burdens, so that that question did not enter into the matter. Even supposing there were no tenant farmers at all, whatever the theory might be, practically, if a man could grow wheat at 40s. a quarter and his tithe was 1*l.* per acre, it was perfectly certain that if that burden were removed or equalised he could grow the wheat at a corresponding reduction. He had been greatly disappointed by the return from investments in land improvements, and he remembered the late Mr. McCombie saying it might have been well for Aberdeenshire in these days if it had not been so much "improved." The outlay thus incurred had been unremunerative, and resulted in heavy losses.

Mr. WALFORD considered that the time had now arrived when the word "grain" should be used instead of "corn." The latter word had now come to have a distinct meaning, viz., Indian corn, and great confusion sometimes arose from the more general use of the word. Grain comprehended all cereals, and was a better word. He would defer at that late hour some other observations he had intended to make, merely remarking that in the United States he had always found amongst the farmers an intelligent appreciation of the uses of statistics.

The PRESIDENT, in proposing a vote of thanks to Major Craigie, said there could be no doubt whatever of the extreme value of the results that gentleman had placed before the Society. Students of the subject had now got the materials in a very compact shape, and no doubt for many years to come the paper would be referred to by investigators. He wished to echo what Mr. Druce and Major Craigie had said when they expressed their regret that the Royal Commission on Agriculture had not made a fuller use of the statistical materials which were placed before them. Considering what the assistant commissioners had done, something ought to have been done in the way of giving a summary of the results as to what the normal production of agriculture in this country was, and, as far as possible, the deterioration which had taken place in the years of depression. The materials existed, and it would have been worth while to spend a good deal of money in working them up. Mr. Sewell Read made some remarks upon the comparative value of returns of produce as compared with returns of acreage, which were extremely important, and ought to be very carefully considered. Some foreign countries thought that a census of agriculture at distant periods, supplemented by returns of produce, was the most convenient way of taking agricultural statistics; but in this country, the authorities who were instrumental in having such statistics introduced thought it extremely important that they should first of all, and principally, get a return of the acreage. In their view that was the most important point, because many grain merchants had been accustomed to make estimates of produce which were more or less trustworthy, and it was thought that if the Government would supplement those estimates by a census of

the acreage, the information would be complete. He believed that to some extent that view was correct. Of course he did not say a word against obtaining a return of the produce itself, but simply wished to point out that that was the history of the subject, and that whatever opinion might be held as to the relative value of returns of produce and returns of acreage, yet the returns of acreage had satisfied a very important demand. A good many conveniences had been found in having an annual census of the acreage. To a certain extent the data in this country for obtaining both official and unofficial estimates of products were, perhaps, better than in any other country. The fact that it was taken annually enabled a check to be applied. Though there might be a margin of error in any particular year, yet if the figures for different years were drawn from the same sources, the comparison for a series of years might be almost mathematically accurate to all intents and purposes. With reference to the estimate as to the loss by the agricultural depression that he himself made about eighteen months ago, he wished to point out that the figures he then brought forward were not his estimate of the loss which had occurred to the agricultural interest. His object distinctly was to bring before those interested in the subject a mode of calculation which would help to check their own returns, and he did not put forward the result as a complete one. It was simply the result of the calculation which he followed to which he believed great value was to be attached, but which was only to be used to corroborate or confirm other estimates. In these matters the utmost good faith should be observed. Different methods should be taken; the results should all be put together, then analysed and compared; and so a good result might be obtained. Mr. Harris had argued that Sir James Caird's estimate of the annual production was much too high; but if they followed out the method of calculation which he (Mr. Giffen) used they would find that the 200 million pounds which Mr. Harris had referred to would give, allowing for the imports, between 8*l.* and 9*l.* per head as the consumption of this country. If those figures were worked out, it would be seen that the apparent depression, the diminution of production in the bad years compared with the good times before, was so great as to be almost incredible. Mr. Harris should therefore revise his own figures and consider what they implied. A great deal had been said about the taxation on agricultural interests. The subject was not strictly included in that under discussion; but as it had been raised, he might be allowed to say (and in this all political economists would agree with him) that the greater part at least of the so-called burdens on agriculture were in no way burdens on the cultivating interest. They were a mere distribution of the profit. If there was no profit in farming there would be no rent and no rates, and the payment of rent and rates was simply a distribution of the profit. With regard to the statement that American taxes were much less than in this country, he must say, from all the information he had upon the subject, that the American taxation upon property, including that of land, was very much heavier indeed than in this country. The taxation in England was comparatively light, but the local taxation in America was very heavy.

Major CRAIGIE (in reply) thanked the Society for their kindness in passing a vote of thanks to him. The President, he said, had warned them against running off into side issues—such as the relative amount of the burdens on land, a matter which only indirectly concerned a paper on records of production, and had pointed out that these burdens did not fall, theoretically at least, on the cultivators; but in his paper he (Major Craigie) had used the term “capital invested in agriculture,” and he was of opinion that it could be proved to demonstration that the present taxation falling on the agricultural interest as a whole, did unduly and unequally affect the capital belonging both to the tenants and to the landlords employed in the cultivation of the soil. If this was over taxed, surely cultivation must be affected in some way. In reference to the calculation made of diminished production as determined by increased food imports, in comparing the amount to be allowed for the increase of population, the question of the head rate of consumption was a cardinal feature. Now, in his evidence before the Royal Commission, Sir James Caird gave 9*l.* 5*s.* 6*d.* as the total consumption per head, while Mr. Giffen based his figures on 12*l.* per head. The difference was very considerable, but he had not yet learned on what ground the two calculations differed so largely.

The PRESIDENT said his impression was that Sir James Caird did not allow for the consumption by cattle in the 9*l.* per head, whereas the 12*l.* per head was the total consumption of agricultural products, no matter how consumed.

Major CRAIGIE said that Mr. Bourne did not appear to have quite caught the force of the tables given in the paper with regard to barley. During the past few years the production was under the average, and when compared with Sir James Caird's figures, it would be seen to be decidedly less. During the last few days he had had a correspondence with Sir J. B. Lawes, who had put his estimate of the production of barley under that given in the paper. They had also had much more bad and discoloured barley in proportion of late years than they had ever had before, and that had greatly reduced the price obtained for this product. They therefore could not rely on barley to make up for the loss of wheat. Oats, however, had better withstood the climatic influences to which the other grains had succumbed. During the past year however there certainly had been a fairly luxuriant crop of oats. He hoped that some statisticians who had time to spare would make profitable use of the figures given in the paper and carry them further, if so he trusted his tables would form the basis of future discussions of considerable interest.

The PARLIAMENTARY REPRESENTATION of the METROPOLITAN, AGRICULTURAL, and MANUFACTURING DIVISIONS of the UNITED KINGDOM, with SUGGESTIONS for its REDISTRIBUTION.

By ARTHUR ELLIS.

[Read before the Statistical Society, 20th February, 1883. The PRESIDENT in the Chair.]

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PART I.—INTRODUCTION.

EVERYBODY is aware, in a general way, that population and wealth have grown far more rapidly in the towns than in the rural districts. Free trade has shown our *forte* to be industry, not agriculture, and our hands, minds, and capital have forsaken the country for the towns. The following is an attempt to define the changed relations of town with country during the ten years from 1871 to 1881, in order to mark out the grounds for some necessary conclusions. It is proposed, first, to select and explain the facts bearing on the subject; secondly, to trace the tendencies of a recent period; and then to show the ill-fitting jacket with which our newest, most progressive, and most numerous populated places are clad in the way of Parliamentary representation. Perhaps action will be seen to be also necessary as the result of these conclusions. For instance, if it appear that important sections of the people are insufficiently represented in the national councils, and unimportant sections are over-represented, the sooner some remedy is applied, the better and more quietly will that remedy have chance of working. Old as the country is, face and features have changed marvellously—we might almost say its muscular power has been transferred in response to the wants of the time—during the ten years under review. But “land” is frightfully—the word is used in its full meaning—over-represented beside the flesh and blood and intelligence which crowd into the towns. Our representative institutions appear stiff, unyielding,

and what seems to be wanted is a system for giving them elasticity without impairing their solid character. Neither Liberals nor Conservatives desire revolution; but that will be the logical outcome of obstinate persistence in the system which has perpetrated a feudal deference to "acres," ignoring the sinew and intelligence of the close-huddled occupants of towns.

Explanation of Groups.

The clearness of this paper is throughout under the disadvantage which results from inability to sum up results in one total. It is necessary to compare rather than summarise. In order to sort and tie up the results arrived at as neatly as possible, the method adopted is to take the divisions into which the Local Government Board parcels out the country, and to group those into greater divisions thus:—

A includes	1. Metropolitan Division.
B ,,	II. South-Eastern.
	III. South-Midland.
	IV. Eastern.
	V. South-Western.
C ,,	VI. West-Midland.
	VII. North-Midland.
	VIII. North-Western.
	IX. York.
	X. Northern.
	XI. Monmouth and Wales.
D ,,	Scotland.
E ,,	Ireland.

A includes the metropolitan area; B, the counties chiefly agricultural; C, those chiefly manufacturing; while D relates to Scotland, and E to Ireland.

Distinguishing Features of the Manufacturing Districts.

It may be seen in the statistics of coal production, which are those districts most attractive to manufacturing trades and industry. The figures may be thus set out:—

Coal Raised in United Kingdom..

	1871.	1881.	Increase.	Per Cent.
	Tons.	Tons.	Tons.	
A. Metropolitan division.....	Nil	Nil	Nil	—
B. Agricultural ,, 	674,000	732,000	58,000	8·6
C. Manufacturing ,, 	101,073,000	132,498,000	31,415,000	31·1
D. Scotland ,, 	15,438,000	20,823,000	5,385,000	35·0
E. Ireland ,, 	166,000	128,000	(-) 38,000	dec.

The production of the year 1881 is put beside that for 1871 in order to bring out the tendency of things industrial in this country to develop, while, as we see elsewhere, things agricultural contract. It would have been extremely interesting to compare the number of factory workers in various districts in the same way; but unfortunately we have only the returns for 1871, which stand as follows:—

Factory Workers in United Kingdom (1871).

[See Miscellaneous Statistics of the United Kingdom.]

A. Metropolitan division	3,288
B. Agricultural „	22,417
C. Manufacturing „	688,047
D. Scotland „	126,317
E. Ireland „	61,965

These two sets of figures seem amply to justify us in separating the agricultural from the manufacturing divisions in England in the way pursued.

Population of Divisions.

The Local Government divisions have been kept in view as far as possible in classifying the population of England, but those divisions lap over and infringe upon neighbouring counties in a way which prevents us taking that classification for all purposes. When it is necessary to go by counties instead of Local Government districts we may include, as far as possible, the same counties, and, for instance, substitute Middlesex for the Metropolitan district, although the latter overlaps part of Surrey, Kent, &c. The results are thus contrasted:—

Population in 1881 of England and Wales.

	Poor Law Divisions.	County Divisions.	Increase in 1881 on 1871.	
			Poor Law.	County.
Metropolitan	3,814,571	2,918,814	Per cent. 17·3	Per cent. 14·9
Agricultural	7,283,561	8,172,059	8·6	10·2
Manufacturing	14,870,154	14,877,413	16·7	16·6
Total England and Wales	25,968,286	25,968,286	14·4	14·4

More stress may be laid on the Poor Law classification, inasmuch as it better throws up the distinction between the metropolitan and the agricultural divisions. The increase in the latter is from either view under average; but while it appears as 10·2 per cent. in the county divisions, it is only 8·6 per cent. according to the better defined Poor Law classification.

PART II.—THE TENDENCIES OF THE PERIOD UNDER REVIEW.

Having now sketched the plan of the present paper, I have to show what are the material changes referred to, which are so well calculated to bring out by contrast the stiffness of our anciently rooted institutions. The acreage alone of the country remains constant, and the representation of the people varies little more

I.—*The Tendencies of the Decade.*—

	1. Metropolis.		2. Agricultural.	
	1871.	1881.	1871.	1881.
Population. Number (for } Poor Law purposes) }	3,252,358	3,814,571	6,706,586	7,283,561
Paupers No.	135,576	95,822	429,573	324,456
"Poor" rates	£2,471,516	£2,651,637	£4,739,321	£5,348,025
Cost of poor.....	£1,646,103	£1,907,155	£2,853,634	£2,515,023
Electors. Boroughs	263,431	337,692	195,249	239,396
Assessments A and B } 000's	£20,029,	£25,272,	£67,051,	£75,786,
" D } omitted	£63,184,	£84,886,	£30,958,	£38,678,
Inhabited houses	321,229	369,831	1,418,628	1,524,509
Factory workers	3,288	—	22,417	—
Coal raised tons.	nil	nil	674,000	732,000
M.P.'s (in 1874). Boroughs....	20		125	
Ditto, Counties. Total, all } England, say, all agricultural }	—		187	

Metropolis contains: Metropolitan Poor Law area, or in other cases, Middlesex.

Agricultural division: South-Eastern, South-Midland, Eastern, and South-Western counties.

Manufacturing division: West-Midland, North-Midland, North-Western, York, Northern, and Welsh counties.

The Changes in Detail, by Divisions.

We may proceed to review the extent of the relative increases in the following form:—

II.—*Population (Poor Law Statistics).*

Divisions.	1871.	1881.	Increase.	Per Cent.
Metropolitan	3,252,358	3,814,571	562,213	17.3
Agricultural	6,706,586	7,283,561	576,975	8.6
Manufacturing.....	12,747,087	14,870,154	2,123,067	16.7
Total England and Wales	22,706,031	25,968,286	3,262,255	14.4
Scotland	3,367,922	3,734,370	366,448	10.9
Ireland	5,395,007	5,159,839	— 235,168	4.4

than this acreage. All else—the population, their means of subsistence, their intelligence and ideas, their responsibilities—change, in some divisions the disturbance being more rapid and complete than in others. Those who can grasp the meaning of a multitude of figures, will be glad to have at once before them the following summary table, illustrating the tendencies referred to:—

Summary for Great Divisions.

3. Manufacturing.		4. Scotland.		5. Ireland.	
1871.	1881.	1871.	1881.	1871.	1881.
12,747,087	14,570,154	3,367,922	3,734,370	5,395,007	5,159,839
407,225	352,920	130,202	105,455	69,791	114,680
£4,910,603	£6,340,930	£894,896	£939,367	£734,686	£965,128
£3,386,987	£3,679,958	£810,456	£853,348	£729,300	£965,100
791,449	1,013,434	171,912	201,500	49,025	57,497
£87,728,	£105,146,	£22,368,	£27,310,	£15,836,	£23,271,
£82,274,	£96,434,	£19,411,	£25,566,	£8,050,	£9,763,
2,519,359	2,919,504	412,185	—	961,380	—
688,047	—	126,317	—	61,965	—
101,073,000	132,498,000	15,438,000	20,823,000	166,000	128,000
152		26		37	
—		32		64	

III.—*Paupers (Annual Local Government Report).*

Divisions.	1871.	1881.	Decrease.	Per Cent.
Metropolitan	135,576	95,822	— 39,754	20·5
Agricultural	378,950	268,285	— 110,665	29·2
Manufacturing	457,848	409,091	— 48,757	10·6
Total England and Wales	972,374	773,198	— 199,176	20·5
Scotland	130,202	105,455	— 24,747	19·0
Ireland	69,791	114,680	+ 44,889	64·2

IV.—*Expended on Poor Relief (Annual Local Government Report).*

Divisions.	1871.	1881.	Increase.	Per Cent.
	£	£	£	
Metropolitan	1,646,103	1,907,155	261,052	15·8
Agricultural	2,853,634	2,515,023	— 338,611	— 11·9
Manufacturing	3,386,987	3,679,958	292,971	8·7
Total England and Wales	7,866,724	8,102,136	235,412	2·7
Scotland	810,456	853,348	42,892	5·3
Ireland	729,300	965,100	235,800	32·3

V.—*Income Tax—Assessments A and B (Lands).*

[000's omitted.]

Areas.	1871.	1881.	Increase.	Per Cent.
	£	£	£	
Metropolitan	20,029,	25,272,	5,243,	26·2
Agricultural	67,051,	75,786,	8,735,	13·0
Manufacturing	87,728,	105,146,	17,418,	19·9
Total England and Wales	174,808,	206,204,	31,396,	18·0
Scotland	22,368,	27,310,	4,942,	22·0
Ireland	15,836,*	23,271,*	—	—

* No exact comparison for Ireland can be made, inasmuch as, before 1874 the *net* figures only were returned under Schedule B. The real rate of increase probably did not amount to 5 per cent.

VI.—*Assessment D† (Incomes).*

[Tables V and VI are taken from the Miscellaneous Statistics, 1875, and from the Parliamentary Paper on Income Tax, printed July, 1882.]

[000's omitted.]

	1871.	1881.	Increase.	Per Cent.
	£	£	£	
Metropolitan	63,184,	84,886,	21,702,	34·3
Agricultural	30,958,	38,678,	7,720,	23·0
Manufacturing	82,274,	96,434,	14,160,	17·2
Total England and Wales	176,416,	219,998,	43,582,	24·8
Scotland	19,411,	25,596,	6,185,	31·8
Ireland	8,050,	9,763,	1,713,	21·4

† In 1872, and again in 1876, exemptions were extended, but this applies all round.

VII.—*Electors : Boroughs and Cities.*

[Miscellaneous Statistics for 1871, and recent Parliamentary returns.]

	1871.	1881.	Increase.	Per Cent.
Metropolitan	263,431	337,692	74,261	28·2
Agricultural	195,249	239,396	44,147	22·6
Manufacturing	791,449	1,013,464	214,015	27·0
Total England and Wales	1,250,129	1,590,552	332,423	25·8
Scotland	171,912	201,509	29,597	17·2
Ireland	49,025	57,497	8,472	17·3
Universities in United Kingdom ...	23,209	29,365	6,156	26·5

VIII.—*Electors: Counties, Nominally Agricultural.*

	1871.	1881.	Increase.	Per Cent.
Metropolitan.....	23,396	33,173	9,777	42·0
Agricultural	303,638	345,121	41,483	13·6
Manufacturing.....	473,111	553,609	80,498	17·0
Total England and Wales	800,145	931,903	131,758	16·4
Scotland	78,919	96,570	17,651	22·4
Ireland	175,439	168,217	— 7,222	— 4·1

IX.—*Inhabited Houses (Census).*

	1871.	1881.	Increase.	Per Cent.
Metropolitan.....	321,229	369,831	48,602	15·1
Agricultural	1,418,628	1,544,509	125,881	8·8
Manufacturing.....	2,519,359	2,919,504	400,145	15·9
Total England and Wales	4,259,216	4,833,844	574,628	13·5
Scotland	412,185	—	—	—
Ireland	961,380	914,108	— 47,272	— 5·2

So much being gathered from the comparison of population, wealth, responsibility, &c., at the two periods, we have next to glance at the position now arrived at.

PART III.—PRESENT ANOMALIES.

A short sketch of the progress of the electoral reform is contained in the following passage, taken from the “Daily News” of 13th December, 1882:—

“The effect of Lord Grey’s measure was to abolish the condition of things which left the franchise to be the monopoly and the exclusive possession of nobles and squires, and to admit the middle and industrial classes to their place in the constitutional system. But the Reform Act of 1832 left the working classes practically out of consideration altogether. It not merely failed to give them any extended privileges; it actually took away from them here and there certain privileges which they then possessed under various odd forms of ‘fancy franchise.’ Lord John Russell, Mr. Bright, Mr. Cobden, and later still Mr. Gladstone saw that the time had come when this mistake must be corrected. At length it so happened that even Mr. Disraeli became convinced of the need for a further step in the development of reform; and moving boldly on the way made smooth for him by the labour of his political opponents, he succeeded in carrying household suffrage in the cities and boroughs of England. It is obvious that the work is still incomplete. No possible reason can be assigned for treating the humbler residents of a county as a class politically apart from all other classes. Other anomalies too still remain in our constitutional system. We are warranted in the confident belief that it will be Mr. Gladstone’s work to complete by their removal the reform legislation of 1832. In the new parliament which that reform called into existence he first took his seat as a member of the House of Commons. It will be a fitting crown for his career as a statesman if he is enabled to carry the reform of our electoral system to its full and proper development.”

Proportion of Electors to Inhabited Houses.

Sir Charles Dilke, in a speech to his Chelsea constituents last December (30th), made two remarkable statements: First, he said—"The assimilation of the franchise to that existing in English or Scotch boroughs is a necessary first step, or else must be the accompaniment of any such redistribution of political power as all Liberals and Radicals desire, and which has been advocated here to-night. A real redistribution of seats is absolutely impossible unless you have an equal franchise through the length and breadth of the land." Secondly, he said—"There are two classes to be chiefly considered, and who would be introduced to share in the government of the country by an equalising of the franchise, viz., the townsmen who happen by mere geographical accident to live outside the borough boundaries, and the agricultural labourers. It has been computed, speaking roughly, that an assimilation of the franchise would confer about a million fresh votes, or half a million to each of these two classes, and it would undoubtedly admit to the franchise a large number of miners."

Now the proportion of electors to inhabited houses in England has increased on the whole during the ten years under review from 48·1 per cent. to 52·2 per cent., and that includes county as well as borough electors. It is apparent that the occupiers of nearly half the inhabited houses in England are still unrepresented, and allowing for female occupants, Sir Charles Dilke's numerical estimate appears well within the bounds of probability. As to his remark, that an assimilation of borough to county franchise is a necessary first step, it is plainly true, for at present there is no understanding the method of representation in England and Scotland. On a study of the proportions, the only conceivable conclusion is that there is no method. We are fast arriving at a state of things in which the borough and city electors will number double those of the county electors. In 1874 the English borough and city members were 297 in number, the county members of Parliament 187. In 1881 (various incompetent boroughs having been deprived of their abused rights) the number of borough and city members was only half as many again, numbering 285, while the counties returned 186 members; and thus the disproportion between the growth of non-electors and the stationariness of their representatives is more and more apparent. What system is there visible for accommodating the representation of either boroughs or counties to the rate of growth in the populations? The drift of numbers, wealth, and intelligence has been distinctly from the county areas to those of boroughs and cities. Unless something be done, unless a "sliding

"scale" with some approach to scientific self-adjustment be introduced, anomalies will be continually cropping up. Already the many in the towns are left to fight over the return of relatively few representatives. In the counties the canvassing for votes is not necessary to so wide an extent, and probably the county electors are amenable to pressure from landed proprietors. But if "land" is to be represented for itself without reference to the number of those who live on it, let us at least have an understanding. After an assimilation of county and borough franchise, there would be some possibility of getting at the quite elementary facts necessary for appreciating the proportion of qualified electors to representatives. There may possibly be some concealed reason why a county vote should be more rare, more precious, and more effective when got than a borough vote: but if so, let us understand on what principle the superiority rests, always supposing there is any such principle, of which doubts are justified.

Proportion of Electors to Population.

This head need not be here pursued, those who have seen the Financial Reform Almanac being familiar with the gross disproportions not only as between counties and boroughs, but also as between counties and counties on the one hand and boroughs and cities on the other:—

<i>Counties.</i>		<i>Boroughs.</i>	
	Members.		Members.
95 with 7,173,050 souls return	154	181 with 3,336,389 souls return	231
64 „ 13,000,590 „	129	71 „ 11,365,279 „	129

Assessments and Population.

If the disproportion between mere numbers and representation is growing worse, it is also apparent that wealth is shifting in a way which must put old methods of representation out of joint. Let us set side by side the ratios of increase on income tax assessments on landed property (Schedules A and B) and those on professional and trading incomes (Schedule D). Particulars will be found in Appendix B. The comparison for the great divisions runs thus:—

Increase of Assessments in Ten Years.

Area.	A and B.	D.
	Per cent.	Per cent.
Metropolitan	26'2	34'3
Agricultural	13'0	23'0
Manufacturing.....	19'9	17'2
Total, England and Wales....	18'0	24'8
Scotland	22'0	31'8
Ireland	(about) 5'0	21'4

The incomes from the ownership and occupation of land have increased at a great rate, considering the strict limitation in the quantity of land in this country. Land, it will also be observed, grows valuable most rapidly in and near the Metropolis; in purely agricultural districts we know without statistics that the tendency of land has not been towards greater value during the last six years; in the manufacturing districts land incomes have increased about 20 per cent. in the interval. Setting the increases beside those from trades and professions, they seem poor and small; and the conclusion is reasonable that any augmentation in the yield of land is largely due to its proximity to the scene of those pursuits which flourish best in towns—not due to its cultivation that is, but to the crowding together of the population in particular spots for profit or convenience. If this is correct, the argument in favour of numbers as a cause of wealth, and therefore a basis of power, is strengthened.

Logical Result of Assimilation of Franchise.

Although the aim of this paper is not of a partisan kind, it is useless to pretend to ignore the drift of a reform in county franchise. Accordingly a table is added, which shows by divisions how greatly the returns of Liberal members of the House of Commons predominate over those of Conservatives in the case of boroughs and cities: while the counties, especially those at a distance from the manufacturing districts, return far more Conservatives. Where acres are most Liberals are least, Scotland excepted. It appears therefore almost safe to predict that an extension of household suffrage would tend to diminish the strength of the party which has hitherto drawn so many of its members from landed constituencies in the counties. The figures, condensed, are these:—

Members of Parliament returned by Boroughs and Counties respectively, distinguishing Liberals from Conservatives.

Divisions.	Boroughs and Cities.		Counties.	
	Liberals.	Conservatives.	Liberals.	Conservatives.
Metropolis	14	8	—	2
English agricultural	63	49	16	66
„ manufacturing	123	28	49	53
Scotland	25	1	25	7
Ireland	26	11	53	11

These figures should, on the other hand, reassure those who vaguely fear an entire obliteration of the Conservative party as a result of the assimilation of county to borough franchise. Even

the boroughs in the agricultural division return a large proportion of Conservatives; while in Scotland there is little room for the Liberals to gain many more representatives, so much do they preponderate already. The details, of which the foregoing is a summary, are now appended. No. 1 includes the metropolitan area; Nos. 2 to 5 inclusive comprise the agricultural division, to which reference has been repeatedly made; and Nos. 6 to 11 comprise the distinctively industrial section of England and Wales:—

	Borough and City Members.		County Members.		Total M.P.'s.	Number of Acres. (000's omitted.)
	L	C.	L.	C.		
1. Middlesex	14	8	—	2	24	181
2. Surrey	—	1	—	6	7	483,
Kent	3	8	—	6	17	1,004,
Sussex	4	7	—	4	15	934,
Hants.....	7	4	—	4	15	1,032,
Berks	4	1	1	2	8	450,
	18	19	1	22	60	3,903,
3. Hertford	—	1	1	2	4	391,
Bucks	4	1	1	2	8	467,
Oxford	1	1	1	2	5	470,
Northampton.....	4	—	1	3	8	630,
Hunts.....	1	2	1	1	5	230,
Bedford	2	—	2	—	4	296,
Cambridge	2	—	1	2	5	525,
	14	5	8	12	39	3,009,
4. Essex	3	1	—	6	10	1,055,
Norfolk	3	1	1	5	10	1,356,
Suffolk	2	3	—	4	9	950,
	8	5	1	15	29	3,361,
5. Wilts	4	7	—	4	15	859,
Dorset	3	4	1	2	10	627,
Devon.....	7	5	1	5	18	1,655,
Cornwall	5	3	4	—	12	870,
Somerset	4	1	—	6	11	1,050,
	23	20	6	17	66	5,061,
6. Gloucester	7	1	2	2	12	805,
Hereford	2	1	2	1	6	533,
Salop	3	3	—	4	10	841,
Stafford	8	3	3	3	17	732,
Worcester	6	1	2	2	11	472,
Warwick	5	2	1	3	11	566,
	31	11	10	15	67	3,949,

	Borough and City Members.		County Members.		Total M.P.'s.	Number of Acres. (000's omitted.)
	L.	C.	L.	C.		
7. Leicester	2	—	1	3	6	512,
Rutland	—	—	—	2	2	95,
Lincoln	6	—	—	6	12	1,768,
Notts	7	1	1	3	12	526,
Derby	2	—	5	1	8	656,
	17	1	7	15	40	3,557,
8. Cheshire.....	3	1	—	6	10	705,
Lancashire.....	14	8	4	4	30	1,208,
	17	9	4	10	40	1,913,
9. Yorkshire	24	5	7	3	39	3,883,
10. Durham	9	—	3	1	13	648,
Northumberland	5	1	2	2	10	1,290,
Cumberland	3	1	3	1	8	970,
Westmoreland	1	—	—	2	3	501,
	18	2	8	6	34	3,409,
11. Monmouth.....	1	—	—	2	3	368,
South Wales	10	—	7	1	18	2,727,
North „	5	—	6	1	12	1,995,
	16	—	13	4	33	5,090,
Scotland	25	1	25	7	58	—
Ireland	26	11	53	11	101	—
Universities (2 Liberals, 7 Con- servatives).....	—	—	—	—	9	—

PART IV. CONCLUSION.—*A System of Representation.*

It seems necessary to formulate some kind of basis upon which representation should rest. Various tests present themselves in a review of the qualifications requisite on the part of those to whom votes are to be confided. These are: the population test, the wealth test, the responsibility test, as defined by the burden of the support of the poor, the acreage test. At present *acres* seem to have most to do in determining the quality of members for any part of the country; but some concessions—these being quite inadequate, however—are made for population, when closely packed, as in the metropolis, while bog and heath, as in Ireland and Scotland, naturally do not count for so much as agricultural or town lands. We see from the table given below, that for every member returned from the metropolitan area (the acreage of Middlesex is here taken to represent that area), there are 7,542 acres;

while the agricultural division returns one member per 79,000 acres; the manufacturing division one per 86,170 acres; Scotland one per 336,138 acres; and Ireland one per 206,089 acres. Judged by this test alone, it would seem at first that the Metropolis is over-represented; but that is far from being the true state of the case. Taking *population*, we find there is only one member per 158,940 souls for the metropolitan area; while the agricultural division sends one per 37,544 souls; the manufacturing, one per 58,776; Scotland, one per 64,386 souls; and Ireland, one per 51,087 souls. Or, taking the proportion of members to the number of qualified voters, the following similar result comes out:—

	Voters per Member Returned.
Metropolitan division, England	15,824
Agricultural „	3,108
Manufacturing „	6,190
Scotland	5,139
Ireland	2,235
Universities	3,263

This test shows that the Metropolis (Middlesex) is by no means over-represented, but very much otherwise: to return one member, whether for county, borough, or city, an average of 15,526 voters are called into the contest. In the agricultural division less than one-fifth of this number are qualified to vote, and who is there hardy enough to say that a clodhopper's vote is really so much better weighed or deservedly accounted so far more valuable than that of the average dweller in or around London? The thing is absurd. Irish votes again have a force seven times that of those belonging to dwellers about the Metropolis. This may be because, so many Irishmen being unprovided with votes, it is necessary to give the able voters all the more power; and something is also to be said in the same way, because Irish peers do not sit in the House of Lords of their own right. Still the anomaly is striking, after all allowances are made. Next we come to the *wealth* test: there again the Metropolis is severely ill-treated. Taking the assessments of income tax from land (A and B Schedules), and from employments (D), the proportions per member are:—

	A and B.	D.
	£	£
Metropolitan division, England....	1,053,000	3,537,000
Agricultural „	387,000	197,000
Manufacturing „	416,000	381,000
Scotland	471,000	441,000
Ireland	230,000	97,000

Metropolitan wealth is therefore of singularly small account as an electoral qualification. The wealth test is of itself of the less importance, since wealth, in modern times at least, is transferable, and

in a sense portable. Those in towns who, being wealthy, desire voting power and influence in the county can get it, and do get it occasionally by bringing their wealth to bear upon rural districts. Wealth may have been made in the slums of cities, but it can be made effective in the country. As a matter of fact, the tendency of rich merchants, shopkeepers, &c., has been towards a settlement in country places. Much stress should perhaps not be laid on the wealth test, a man and voter being a man and voter "for a" "that;" but in conjunction with the non-recognition of the metropolitan population, the way in which numbers and wealth alike are pushed aside in deference to the feudal attributes of "acres," is too startling to be passed over without noting the mute but strong protest of the statistics. Take Ireland now. The average income from land which returns a voter is but a fifth of the similar income about the Metropolis, while the average professional, &c., income is about a fortieth. The disproportion between the agricultural and the metropolitan divisions in these respects is hardly less striking. Again, with inhabited houses, although the happy agricultural divisions return one member per 7,972 houses—a great part of these houses conferring no votes, be it remembered—the Metropolis has, so to speak, to expend 15,410 inhabited houses on each member, and the manufacturing division expends 11,540 houses on each member returned to the House of Commons. Lastly, we come to the *responsibility* test. The Metropolis has a far greater charge in number of paupers to be supported than any other division, taking the proportion per member returned; while Ireland has a disproportionately small responsibility of the kind. Whether we look at the number of paupers, or the cost of their maintenance, these disproportions are manifest. The following table (to be read downwards) shows the anomaly better than words could bring it out:—

Charge of Paupers on Constituencies: average per M.P. returned (1881).

Divisions.	Number of Paupers.	Direct Cost of Maintenance.	Poor Rates Inclusive.
		£	£
Metropolis	3,993	79,465	120,524
Agricultural	1,383	12,964	27,286
Manufacturing	1,395	14,546	25,063
Scotland	1,818	14,713	16,334
Ireland	1,135	9,555	9,556

Having thus stated some of the chief tests on which, theoretically considered, the representation of the people should rest, it remains most perplexing how they are to be assimilated. Should, for instance, 10,000 acres be considered to confer as much right to a representative as 10,000 inhabited houses? Or should the payment of 20,000*l.*, for maintenance of the poor, count for as much

as half a million assessed under Schedules A and B? The qualifications of various constituencies are too various, they will not mix. It would be easy enough to draw up a set of arithmetical rules according to which population, acreage, houses, pauper charges, &c., should confer rights in their degrees; but who is to fix the basis for these rules? I only venture here to lay stress upon the apparent necessity, if anything like system is to be adopted, of weighing *all* the considerations enumerated, and not taking one qualification to the exclusion of the rest. Perhaps, however, the following figures will help in defining our notions of what is right or wrong in this matter:—

Comparison per M.P. (Exclusive of House of Lords).

Extent, Population, Electors, Assessments, Inhabited Houses, Burden of Paupers, Poor Rates, by Counties and Divisions, in 1881.*

	Acres.	Popula- tion.	Electors	Assessments, [100's omitted.]		In- habited Houses.	Paupers.	Charge of Paupers	Number of Members Returned.
				A and B.	D.				
				£	£			£	
1. Metropolis or } Middlesex }	7,542	158,940	15,824	1,053.	3,537.	15,410	3,993	79,165	24
2. Surrey	—	—	—	—	—	—	—	—	7
Kent	—	—	—	—	—	—	—	—	15
Sussex	—	—	—	—	—	—	—	—	15
Hants	—	—	—	—	—	—	—	—	15
Berks	—	—	—	—	—	—	—	—	8
Average 2	65,050	41,435	4,187	476.	366.	10,493	1,257	13,889	60
3. Herts	—	—	—	—	—	—	—	—	4
Bucks	—	—	—	—	—	—	—	—	8
Oxford	—	—	—	—	—	—	—	—	5
Northampton ...	—	—	—	—	—	—	—	—	8
Hunts	—	—	—	—	—	—	—	—	5
Bedford	—	—	—	—	—	—	—	—	4
Cambridge	—	—	—	—	—	—	—	—	5
Average 3	77,155	31,435	2,556	360.	115.	6,665	1,470	11,017	39
4. Essex	—	—	—	—	—	—	—	—	10
Norfolk	—	—	—	—	—	—	—	—	10
Suffolk	—	—	—	—	—	—	—	—	9
Average 4	115,900	47,505	3,374	385.	160.	9,895	1,743	16,350	29
5. Wilts	—	—	—	—	—	—	—	—	15
Dorset	—	—	—	—	—	—	—	—	10
Devon	—	—	—	—	—	—	—	—	18
Cornwall	—	—	—	—	—	—	—	—	12
Somerset	—	—	—	—	—	—	—	—	11
Average 5	76,682	28,073	2,305	290.	115.	5,560	1,290	10,025	66
Average for Division } (Agricultural) }	79,000	37,544	3,108	399.	200.	7,072	1,383	12,964	194

* Population and pauperism statistics for main divisions according to Poor Law estimate; electors by electoral divisions, grouped as nearly as possible to accord with the main divisions, but other figures by counties.

Comparison per M.P. (Exclusive of House of Lords)—Contd.

Extent, Population, Electors, Assessments, Inhabited Houses, Paupers, &c.—Contd.

[illegible]

Summary of the foregoing Table. Average Number, &c., per M.P.

	Acres.	Popula- tion.	Electors	Assessments. [000's omitted]		Houses.	Paupers.	Cost of Paupers.
				A and B.	D.			
				£	£			£
Metropolis	7,542	158,940	15,824	1,053,	3,537,	15,410	3,993	79,465
Agricultural divi- sion	79,000	37,544	3,108	399,	200,	7,972	1,383	12,964
Industrial division	86,170	58,776	6,190	416,	381,	11,540	1,395	14,546
Scotland	336,138	64,386	5,139	471,	441,	—	1,818	14,713
Ireland	206,089	51,087	2,235	230,	97,	9,050	1,135	9,555

A Further Suggestion.

Leaving for a moment the domain of fact for the fields of speculation, I should like to air a suggestion. Beforehand it must be admitted that the oaken constitution of this country cannot be remodelled as if it were in the ductile or sapling stage. Nevertheless, if the patience of the hearers of this paper may be so far tried, it could be suggested that a rational distribution of direct electoral power might serve at least two ends. We have lately been brought in face of the obstruction, the diluted rhetoric, the clumsy and inconsequent debating by a whole House of Commons, in connection with subjects for which sectional committees would be far better suited. Now, might it not be right for Metropolitan voters to elect members for a Metropolitan committee; voters having industrial qualifications to elect members for a committee entrusted with industrial matters; agricultural voters to return members fitted for a permanent committee on rural matters; Irish voters—I hazard this only in logical consequence of the general principle suggested—to elect an Irish committee; Scotch members a Scotch committee? The general conclusions to which these permanent committees came would of course be subject to the decision—a plain Yes or No—of the whole House; but the hurling of an incongruous multitude of debaters upon remote and minor details would perhaps be brought to an end by the method proposed. Other possible developments of systematic voting could easily be pointed to; but public attention at present is not likely to be attracted by anything beyond the immediate cry for rational redistribution of voting power, although a system of permanent committees of the House of Commons is in the background, and may perhaps yet have to be brought forward. Obstructionists could not well be in two committees at once.

APPENDIX A.

	Population (by Poor Law Divisions).		Persons Employed in Factories.	Mines : Coal Raised.	
	1871.	1881.		1871.	1881.
Total England and Wales....	* 22,706,031	25,968,286	—	101,748,000	133,234,000
1. Metropolis, containing	3,252,358	3,814,571	3,288	—	—
Part of Middlesex	2,284,666	2,548,993	—	—	—
„ Surrey	742,155	930,218	—	—	—
„ Kent	225,537	285,360	—	—	—
2. South-Eastern	2,166,756	2,486,151	153	—	—
Part of Surrey	365,279	460,790	—	—	—
„ Kent	628,163	707,936	—	—	—
Sussex	420,910	494,027	—	—	—
Southampton	526,136	575,451	—	—	—
Berks	226,268	247,938	—	—	—
3. South Midland	1,442,648	1,596,041	2,071	—	—
Part of Middlesex	264,854	380,685	—	—	—
Hertford	194,612	202,315	—	—	—
Bucks	155,007	155,885	—	—	—
Oxford	178,329	181,564	—	—	—
Northampton	248,228	277,002	—	—	—
Huntingdon	58,046	53,218	—	—	—
Bedford	151,539	154,249	—	—	—
Cambridge	192,033	191,123	—	—	—
4. Eastern	1,218,726	1,342,923	8,414	—	—
Essex	440,878	551,765	—	—	—
Suffolk	347,210	353,509	—	—	—
Norfolk	430,638	437,649	—	—	—
5. South-Western	1,878,456	1,858,446	11,779	—	—
Wilts	244,667	248,644	—	—	—
Dorset	189,000	184,936	—	—	—
Devon	605,881	609,157	—	—	—
Cornwall	356,266	325,205	—	—	—
Somerset	482,642	490,504	—	674,000	732,000

* Population in 1871, according to periodical pauperism returns. The census gave the total 22,712,266.

APPENDIX A.—*Contd.*

	Population (by Poor Law Divisions).		Persons Employed in Factories.	Mines: Coal Raised.	
	1871.	1881.		1871.	1881.
6. West Midland	2,720,669	3,029,362	24,110	—	—
Gloucester	488,760	525,123	—	1,412,000	1,361,000
Hereford	120,723	118,148	—	—	—
Salop	267,003	265,707	—	1,350,000	892,000
Stafford	877,435	1,006,741	} —	14,281,000	14,858,000
Worcester	336,276	383,188			
Warwick	630,472	730,455			
7. North Midland	1,406,911	1,637,624	45,485	—	—
Leicester	275,171	326,006	—	700,000	1,145,000
Rutland	23,385	23,007	—	—	—
Lincoln	428,051	463,367	—	—	—
Notts	355,404	438,712	—	2,469,000	4,758,000
Derby	324,900	386,532	—	5,360,000	8,509,000
8. North-Western	3,388,399	4,107,155	406,822	—	—
Chester	539,351	621,544	—	975,000	782,000
Lancaster	2,849,048	3,485,611	—	13,851,000	18,500,000
9. York	2,444,592	2,894,527	202,849	—	—
West Riding	1,854,172	2,197,811	} —	12,801,000	18,294,000
East „	306,410	362,390			
North „	284,010	334,326			
10. Northern	1,365,041	1,624,468	6,936	—	—
Durham	693,012	875,507	} —	29,191,000	35,592,000
Northumberland	386,646	434,024			
Cumberland	220,253	250,630	—	1,424,000	1,769,000
Westmoreland	65,130	64,307	—	—	2,000
11. Welsh	1,421,475	1,577,018	1,845	—	—
Monmouth	219,708	234,410	—	4,915,000	5,413,000
South Wales	766,764	881,263	—	9,120,000	16,822,000
North „	435,003	461,315	—	2,500,000	2,672,000
Scotland	3,367,922	3,734,370	126,317	15,438,000	20,823,000
Ireland	5,395,007	5,159,839	61,965	166,000	128,000

APPENDIX A—*Contd.*

	Paupers.		Expenditure on Poor Relief.	
	1st July, 1871.	1st July, 1881.	1871.	1881.
			£	£
1. Metropolis	135,576	95,822	1,646,103	1,907,155
2. South-Eastern..... Total	105,724	75,418	920,593	831,329
Part of Surrey	14,618	11,876	147,808	148,501
„ Kent	28,037	19,418	242,827	216,665
Sussex	21,986	16,966	197,720	180,453
Southampton	28,983	19,738	222,404	199,101
Berks	12,100	7,420	109,834	86,609
3. South Midland Total	81,460	57,286	634,354	547,946
Part of Middlesex	9,674	8,871	86,181	99,559
Hertford	11,883	8,835	88,510	81,473
Bucks	9,711	6,175	77,410	58,141
Oxford	10,796	7,470	85,178	69,330
Northampton	14,687	9,625	111,737	92,192
Hunts	3,035	1,542	24,741	17,408
Bedford	9,596	6,118	65,312	54,843
Cambridge	12,078	8,650	95,285	75,000
4. Eastern Total	78,397	50,558	560,632	474,120
Essex	27,868	18,199	206,014	189,974
Suffolk	22,060	13,112	150,762	116,829
Norfolk	28,469	19,247	203,856	167,317
5. South-Western Total	113,375	85,023	738,055	661,628
Wilts	17,705	11,197	128,572	101,552
Dorset	13,577	9,199	86,908	69,839
Cornwall	17,796	13,805	219,305	203,289
Devon	33,470	26,606	102,241	96,717
Somerset	30,827	24,216	201,029	190,231
6. West Midland..... Total	106,927	100,044	758,781	837,229
Gloucester	25,834	21,454	182,249	180,855
Hereford	6,651	4,994	46,599	46,751

APPENDIX A—*Contd.*

	Paupers.		Expenditure on Poor Relief.	
	1st July, 1871.	1st July, 1881.	1871.	1881.
			£	£
6. West Midland— <i>Contd.</i>				
Salop	9,235	6,417	77,178	68,783
Stafford.....	32,276	36,811	192,733	255,353
Worcester.....	12,992	11,418	92,515	92,459
Warwick	19,939	18,920	167,507	193,028
7. North Midland Total	56,310	43,873	441,264	420,846
Leicester	11,686	8,457	97,076	86,387
Rutland.....	1,204	797	11,252	8,116
Lincoln	20,579	15,444	169,960	148,184
Notts.....	13,845	9,845	96,278	90,949
Derby	8,996	9,330	66,698	87,210
8. North-Western Total	91,649	85,049	807,783	921,219
Chester	16,010	13,612	124,158	138,453
Lancashire	75,639	71,437	683,625	782,766
9. York.....	70,266	72,852	522,896	630,955
10. Northern	51,136	39,639	338,553	351,449
Durham	25,057	20,106	155,138	172,174
Northumberland	15,984	10,851	113,188	107,107
Cumberland	8,170	7,085	53,731	55,571
Westmoreland	1,925	1,597	16,496	16,597
11. Welsh Total	81,560	67,634	517,710	518,260
Monmouth	11,012	10,061	80,243	80,660
South Wales.....	42,686	36,492	262,524	274,469
North „	27,862	21,081	174,943	163,131
Scotland	130,202	105,455	810,456	853,348
Ireland	69,791	114,680	729,300	965,100

APPENDIX B.

	Members Elected, 1850.		Population (Counties).		Inhabited Houses.	
	Boroughs.	Counties	1871.	1881.	1871.	1881.
1. Middlesex	22	2	2,539,765	2,918,814	321,229	369,831
2. Surrey	1	6	1,091,635	1,435,842	168,443	214,788
Kent	11	6	848,294	977,585	151,344	173,311
Sussex	11	4	417,456	490,316	75,385	87,805
Hants	11	4	544,447	593,487	98,232	110,531
Berks	5	3	196,475	218,382	39,638	43,126
	39	23	3,098,307	3,715,613	533,042	629,561
3. Hertford	1	3	192,226	202,990	39,056	41,295
Bucks	5	3	175,879	176,277	37,257	37,599
Oxford	2	3	177,975	179,650	37,849	38,165
Northampton	4	4	243,891	272,524	52,539	57,671
Hunts.....	3	2	63,708	59,614	14,032	13,282
Bedford	2	2	146,257	149,461	30,506	31,545
Cambridge	2	3	186,906	185,475	40,272	41,312
	19	20	1,186,842	1,225,991	251,511	260,869
4. Essex	4	6	466,436	575,930	92,356	109,100
Norfolk	4	6	438,656	444,825	99,428	99,439
Suffolk	5	4	348,869	356,863	76,501	78,529
	13	16	1,253,961	1,377,618	268,385	287,068
5. Wilts	11	4	257,177	258,967	54,874	55,756
Dorset.....	7	3	195,774	190,979	39,461	39,819
Devon	12	6	601,374	604,397	105,200	106,407
Cornwall.....	8	4	362,343	329,184	73,950	69,899
Somerset	5	6	463,483	469,010	92,205	95,130
	43	23	1,880,151	1,852,837	365,690	367,011
6. Gloucester	8	4	534,640	572,480	101,474	108,827
Hereford	3	4	125,370	121,040	26,371	25,627
Salop	6	3	248,111	247,993	50,800	50,756

APPENDIX B.

Electors.				Assessments. [000's omitted.]				
Boroughs, Cities, &c.		Counties.		1871-72.		1880-81.		
1871.	1881.	1871.	1881.	A and B, Lands.	D, Trades, &c.	A and B, Lands.	D, Trades, &c.	
£	£	£	£	£	£	£	£	
263,431	337,692	23,396	33,173	20,029,	63,184,	25,272,	84,886,	1. Middlesex
1,223	1,454	31,171	51,859	6,880,	7,778,	9,198,	11,233,	2. Surrey
24,049	28,815	32,171	38,454	6,942,	3,515,	8,102,	4,382,	Kent
22,913	28,940	13,803	14,516	3,727,	1,900,	4,348,	2,550,	Sussex
24,468	33,938	19,297	21,223	3,819,	1,720,	4,774,	2,720,	Hants
7,424	9,532	7,610	8,107	1,939,	859,	2,139,	1,091,	Berks
80,077	102,679	104,052	134,159	23,307,	15,772,	28,561,	21,976,	
765	1,101	9,610	10,186	1,813,	728,	1,951,	724,	3. Hertford
8,653	8,391	7,559	8,159	1,942,	472,	2,048,	535,	Bucks
8,203	9,186	7,476	7,642	2,000,	648,	2,132,	727,	Oxford
8,406	11,735	11,569	12,038	2,768,	694,	2,968,	1,022,	Northampton
2,258	2,073	3,704	3,927	865,	200,	894,	216,	Hunts
2,122	2,601	6,590	7,335	1,300,	404,	1,368,	468,	Bedford
4,021	5,015	10,147	10,294	2,445,	692,	2,616,	772,	Cambridge
34,428	40,102	56,655	59,581	13,133,	3,838,	13,977,	4,464,	
5,221	6,048	19,516	26,409	4,634,	1,433,	5,206,	1,873,	4. Essex
7,266	10,786	15,426	15,506	4,901,	1,255,	5,188,	1,598,	Norfolk
14,798	18,351	21,017	20,756	3,602,	1,000,	3,808,	1,136,	Suffolk
27,285	35,185	55,959	62,671	13,137,	3,688,	14,202,	4,607,	
13,248	16,380	10,697	10,974	2,931,	808,	3,091,	852,	5. Wilts
6,695	8,044	7,309	7,478	1,929,	487,	2,140,	558,	Dorset
17,783	21,911	27,242	28,596	5,090,	2,075,	5,628,	2,006,	Devon
7,205	7,356	16,609	15,423	2,215,	980,	2,408,	760,	Cornwall
8,528	9,739	25,115	26,239	5,309,	3,310,	5,779,	3,455,	Somerset
53,459	63,430	86,972	88,710	17,474,	7,660,	19,046,	7,631,	
37,569	44,511	20,797	21,306	3,993,	1,754,	4,414,	2,002,	6. Gloucester
3,131	3,722	9,431	9,004	1,825,	253,	1,895,	290,	Hereford
9,200	9,487	13,585	13,524	2,798,	991,	2,992,	976,	Salop

APPENDIX B.—*Contd.*

	Members Elected, 1850.		Population (Counties).		Inhabited Houses.	
	Boroughs.	Counties.	1871.	1881.	1871.	1881.
6.— <i>Contd.</i>						
Stafford	11	6	858,326	981,385	167,614	187,869
Worcester.....	7	4	338,837	380,291	69,988	77,337
Warwick	7	4	634,189	737,188	131,442	149,279
	42	25	2,739,373	3,040,377	547,693	599,695
7. Leicester	2	4	269,311	321,018	58,606	68,020
Rutland	—	2	22,073	21,434	4,766	4,551
Lincoln.....	6	6	436,599	469,994	94,212	100,830
Notts	8	4	319,758	391,984	68,418	82,567
Derby	2	6	379,394	461,141	78,309	92,783
	18	22	1,427,135	1,665,571	304,311	348,751
8. Cheshire	4	6	561,201	643,237	110,449	126,421
Lancashire	22	8	2,819,495	3,454,225	530,490	655,496
	26	14	3,380,696	4,097,462	640,939	781,917
9. Yorkshire	29	10	2,436,355	2,886,304	507,040	595,488
10. Durham	9	4	685,089	867,586	114,705	147,207
Northumberland.....	6	4	386,646	434,024	62,436	70,761
Cumberland.....	4	4	220,253	250,630	44,061	49,055
Westmoreland.....	1	2	65,010	64,184	12,671	12,894
	20	14	1,356,998	1,616,424	233,873	279,917
11. Monmouth	1	2	195,448	211,374	36,169	39,698
South Wales	10	8	764,339	879,841	150,813	170,496
North „	5	7	452,796	480,054	98,521	103,542
	16	17	1,412,583	1,571,269	285,503	313,736
Scotland	26	32	3,360,018	3,734,370	—	—
Ireland	37	64	5,412,377	5,159,839	—	—

APPENDIX B.—*Contd.*

Electors.				Assessments. [000's omitted.]				
Boroughs, Cities, &c.		Counties.		1871-72.		1880-81.		
1871.	1881.	1871.	1881.	A and B, Lands.	D, Trades, &c.	A and B, Lands.	D, Trades, &c.	
£	£	£	£	£	£	£	£	
53,663	62,493	28,849	34,230	4,495,	4,799,	5,416,	5,541,	6.— <i>Contd.</i>
23,079	28,641	16,879	19,023	2,731,	1,486,	2,963,	1,728,	Stafford
55,756	73,901	16,392	18,355	4,365,	4,430,	5,105,	5,340,	Worcester
182,398	222,755	105,933	115,412	20,207,	13,713,	22,785,	15,877,	Warwick
14,397	18,977	14,514	15,913	2,692,	988,	3,093,	1,337,	7. Leicester
14,532	19,885	2,054	1,763	362,	59,	375,	67,	Rutland
—	—	29,239	31,598	6,768,	1,353,	7,304,	1,670,	Lincoln
41,610	47,756	10,266	12,404	2,543,	1,592,	2,963,	1,943,	Notts
10,155	13,167	19,393	22,419	2,661,	3,558,	3,169,	5,018,	Derby
80,694	99,785	75,466	84,097	15,026,	7,580,	16,904,	10,035,	
28,838	34,201	23,289	28,880	3,895,	2,066,	4,636,	2,527,	8. Cheshire
194,032	241,685	63,608	84,607	14,911,	27,969,	19,789,	33,494,	Lancashire
222,870	275,886	86,897	113,487	18,806,	30,035,	24,425,	36,021,	
182,324	231,642	87,835	102,597	16,474,	17,704,	20,101,	18,885,	9. Yorkshire
39,436	59,867	19,880	24,836	2,684,	4,095,	3,696,	4,559,	10. Durham
18,879	37,730	10,372	13,426	2,995,	2,628,	3,657,	2,996,	Northumbria
7,457	9,186	12,717	15,568	1,941,	1,234,	2,249,	1,507,	Cumberland
1,859	1,957	5,070	5,652	763,	245,	886,	274,	Westmoreland
67,631	108,740	48,039	59,482	8,383,	8,202,	10,488,	9,336,	
3,797	5,116	7,764	8,617	1,065,	875,	1,219,	737,	11. Monmouth
37,943	51,920	32,850	38,370	4,438,	2,954,	5,343,	4,105,	South Wales
13,792	16,629	28,327	31,527	3,329,	1,241,	3,861,	1,438,	North „
55,532	73,656	58,941	78,514	8,832,	5,070,	10,423,	6,280,	
171,912	201,509	78,919	96,570	22,368,	19,411,	27,310,	25,596,	Scotland
49,025	57,497	175,439	168,217	15,836,	8,050,	23,271,	9,763,	Ireland

APPENDIX C.

Electors on Register.

	I. Cities and Boroughs.		II. Counties.	
	1871.	1881.	1871.	1881.
1. Metropolis—				
Tower Hamlets	31,560	40,681	23,396	33,173
Chelsea	16,825	30,601		
Finsbury	34,007	44,166		
Greenwich	14,921	22,737		
Hackney	37,930	45,130		
Lambeth	35,181	49,040		
City of London	22,716	25,310		
Marylebone	32,130	34,687		
Southwark	19,321	23,566		
Westminster	18,840	21,774		
	263,431	337,692		
2. Surrey (extra Metropolitan)—				
Guildford	1,223	1,454	31,171	51,859
Kent—				
Canterbury	3,156	3,238	32,171	38,454
Chatham	4,970	5,641		
Dover	3,443	4,326		
Gravesend	2,639	3,456		
Hythe	2,303	3,080		
Maidstone	3,357	3,899		
Rochester	2,551	2,938		
Sandwich	1,730	2,207		
	24,049	28,815		
Sussex —				
Brighton	9,626	12,657	13,803	14,516
Chichester	1,226	1,253		
Hastings	2,823	4,284		
Horsham	800	1,263		
Lewes	1,382	1,445		
Midhurst	997	1,074		
Rye	1,257	1,366		
Shoreham	4,802	5,598		
	22,913	28,940		
Hants—				
Andover	640	869	19,297	21,223
Christchurch	1,534	2,827		
Lymington	680	800		
Newport, Isle of Wight	1,165	1,332		
Petersfield	817	822		
Portsmouth	11,928	17,912		
Winchester	1,611	1,957		
Southampton	6,093	7,419		
	24,468	33,938		

C.—Electors on Register—Contd.

	I. Cities and Boroughs.		II. Counties.	
	1871.	1881.	1871.	1881.
2.— <i>contd.</i>				
Berks—				
Abingdon	845	876	} 7,610	8,107
Reading	3,730	5,312		
Wallingford	1,098	1,229		
Windsor	1,751	2,115		
	7,424	9,532		
3. Herts—				
Hertford	765	1,101	9,610	10,186
Bucks—				
Aylesbury	3,729	4,440	} 7,559	8,159
Buckingham	1,105	1,135		
Wycombe	3,003	1,907		
Marlow	816	909		
	8,653	8,391		
Oxford—				
Oxford	5,387	6,242	} 7,476	7,612
Banbury	1,715	1,873		
Woodstock	1,101	1,071		
	8,203	9,186		
Northampton—				
Northampton	5,912	8,185	} 11,569	12,038
Peterborough	2,494	3,550		
	8,406	11,735		
Hunts—				
Huntingdon	921	1,061	} 3,704	3,927
St. Ives	1,337	1,012		
	2,258	2,073		
Beds—				
Bedford	2,122	2,601	6,590	7,335
Cambridge—				
Cambridge	4,021	5,015	10,147	10,294
4. Essex—				
Colchester	2,975	3,762	} 19,516	26,409
Harwich	637	801		
Maldon	1,609	1,485		
	5,221	6,048		

C.—Electors on Register—Contd.

	I. Cities and Boroughs.		II. Counties.	
	1871.	1881.	1871.	1881.
4.— <i>contd.</i>				
Suffolk—				
Bury St. Edmunds.....	1,284	2,231	} 15,426	15,506
Eye	1,196	1,020		
Ipswich	4,786	7,535		
	7,266	10,786		
Norfolk—				
Lynn	2,460	2,849	} 21,017	20,756
Norwich	12,338	15,502		
	14,798	18,351		
5. Wilts—				
Calne	600	802	} 10,697	10,974
Cricklade	5,761	7,469		
Devizes	860	921		
Malmesbury	1,022	1,057		
Marlborough	626	658		
Salisbury	1,451	1,962		
Westbury	1,102	1,101		
Wilton	885	1,415		
Chippenham	941	1,015		
	13,248	16,380		
Dorset—				
Bridport	983	1,070	} 7,309	7,478
Dorchester	656	886		
Poole	1,419	1,949		
Shaftesbury.....	1,306	1,372		
Wareham	972	1,073		
Weymouth	1,359	1,694		
	6,695	8,044		
Devon—				
Barnstaple	1,636	1,785	} 27,242	28,596
Devonport	3,306	3,917		
Exeter	6,152	7,562		
Plymouth	4,671	6,366		
Tavistock.....	849	876		
Tiverton	1,169	1,405		
	17,783	21,911		
Cornwall—				
Truro	1,442	1,522	} 16,609	15,423
Bodmin	897	895		
Helston	1,066	1,021		
Launceston	740	852		
Liskeard	887	759		
Penryn	2,173	2,307		
	7,205	7,356		

C.—Electors on Register—Contd.

	I. Cities and Boroughs.		II. Counties.	
	1871.	1881.	1871.	1881.
5.— <i>contd.</i>				
Somerset—				
Bath	5,189	6,017	25,115	26,239
Taunton	1,989	2,326		
Frome	1,350	1,396		
	8,528	9,739		345,121
6. Gloucester—				
Bristol	21,816	25,744	20,797	21,306
Cheltenham	3,533	5,134		
Cirencester	1,075	1,157		
Gloucester	4,681	5,320		
Stroud	5,757	6,399		
Tewkesbury	707	757		
	37,569	44,511		
Hereford—				
Hereford	2,298	2,821	9,431	9,004
Leominster	833	901		
	3,131	3,722		
Salop—				
Bridgenorth	1,335	1,208	13,585	13,524
Ludlow	868	996		
Shrewsbury	3,766	3,821		
Wenlock	3,231	3,462		
	9,200	9,487		
Stafford—				
Lichfield	1,309	1,379	28,849	34,230
Newcastle-under-Lyme	2,849	3,152		
Stafford	3,151	3,344		
Tamworth	1,652	2,260		
Walsall	8,170	9,538		
Wednesbury	17,644	19,561		
Wolverhampton	18,888	23,259		
	53,663	62,493		
Worcester—				
Bewdley	1,053	1,261	16,879	19,023
Droitwich	1,370	1,445		
Dudley	12,013	14,947		
Kidderminster	2,350	3,774		
Worcester	5,592	6,393		
Evesham	701	821		
	23,079	28,641		

C.—Electors on Register—Contd.

	I. Cities and Boroughs.		II. Counties.	
	1871.	1881.	1871.	1881.
6.— <i>contd.</i>				
Warwick—				
Birmingham	46,302	63,909	16,392	18,355
Coventry	7,773	8,263		
Warwick	1,681	1,729		
	55,756	73,901		
7. Leicester—				
Leicester	14,397	18,977	14,514	15,913
Rutland	—	—	2,054	1,763
Lincoln—				
Boston	2,581	3,043	29,239	31,598
Grantham	2,023	2,383		
Grimsby	4,712	6,956		
Lincoln	4,083	6,182		
Stamford	1,133	1,321		
	14,532	19,885		
Notts—				
East Retford	7,622	8,183	10,266	12,404
Newark	1,119	2,194		
Nottingham	14,674	17,555		
Stoke-on-Trent	18,195	19,824		
	41,610	47,756		
Derbyshire—				
Derby	10,155	13,167	19,393	22,419
8. Chester—				
Birkenhead	6,738	9,107	23,289	28,880
Chester	6,324	5,804		
Macclesfield	4,839	5,447		
Stalybridge	4,918	5,685		
Stockport	6,019	8,158		
	28,838	34,201		
Lancashire—				
Ashton-under-Lyne	5,286	5,893	63,608	84,607
Blackburn	9,053	13,160		
Bolton	11,801	14,250		
Burnley	5,628	7,414		
Bury	5,518	6,859		
Cliitheroe	1,630	1,958		
Liverpool	46,455	63,221		
Manchester	56,699	58,712		
Oldham	15,663	21,383		
Preston	10,032	11,748		
Salford	17,538	23,928		
Warrington	4,152	6,222		
Wigan	4,577	6,937		
	194,032	241,685		

C.—Electors on Register—Contd.

	I. Cities and Boroughs.		II. Counties.	
	1871.	1881.	1871.	1881.
9. York—				
Bradford	20,662	26,437	87,835	102,597
Dewsbury	7,899	10,060		
Halifax	10,083	12,055		
Huddersfield	11,131	13,266		
Hull	19,012	26,581		
Knarborough	788	758		
Leeds	41,407	49,414		
Malton	1,206	1,396		
Middlesborough	6,368	10,750		
Northallerton	820	918		
Pontefract	1,927	2,360		
Richmond	677	708		
Ripon	1,035	1,132		
Rochdale	9,561	10,788		
Scarborough	2,816	4,301		
Sheffield	31,329	42,402		
Thirsk	973	976		
Wakefield	3,584	4,087		
Whitby	1,946	2,145		
York	9,300	11,108		
	182,324	231,642		
10. Durham—				
Darlington	3,598	5,214	19,880	24,836
Durham	1,946	2,390		
Gateshead	8,632	11,685		
Hartlepool	3,746	7,107		
South Shields	7,378	10,112		
Stockton	4,948	8,062		
Sunderland	9,388	15,297		
	39,436	59,867		
Northumberland—				
Berwick	1,336	1,989	10,372	13,426
Morpeth	2,539	5,749		
Newcastle	12,500	24,261		
Tynemouth	2,504	5,731		
	18,879	37,730		
Cumberland—				
Carlisle	4,426	5,504	12,717	15,568
Cockermouth	1,064	1,100		
Whitehaven	1,967	2,582		
	7,457	9,186		
Westmoreland—				
Kendal	1,859	1,957	5,070	5,652

C.—Electors on Register—Contd.

	I. Cities and Boroughs.		II. Counties.	
	1871.	1881.	1871.	1881.
11. Monmouth—				
Monmouth.....	3,797	5,116	7,764	8,617
South Wales—				
Brecon	808	879	32,850	38,670
Cardiff	5,718	8,831		
Cardigan	1,788	2,074		
Carmarthen	3,529	5,752		
Haverfordwest	1,462	1,555		
Merthyr.....	14,097	14,200		
Pembroke	3,212	3,361		
Radnor	875	947		
Swansea.....	6,454	14,321		
	37,943	51,920		
North Wales—				
Beaumaris	1,773	2,559	28,327	31,527
Carnarvon	3,178	4,093		
Denbigh.....	2,841	3,084		
Flint	3,208	3,795		
Montgomery	2,792	3,089		
	13,792	16,620		

DISCUSSION on MR. ELLIS'S PAPER.

MR. LIONEL L. COHEN said it appeared to him to be difficult, within the limits of such a discussion as would be appropriate to a meeting of the Statistical Society, to test by statistics the theories which the writer of the paper had propounded. In no civilised country could the theory of government be founded entirely upon an arithmetical basis, and such a theory was still more difficult of application in the case of a nation in which various rights and customs had grown up, and were closely interwoven with the life and habits of the people. The author of the paper had said that, theoretically considered, representation should rest upon a certain basis, but what that basis should be was a matter about which opinion was very much divided, and which could not be brought to the test of figures. The true basis was that which the majority of the people held to be the most suitable for their happiness, and that could not be brought to the test of figures in any way. The paper stated that different qualifications would not mix. So much the better. They did not want to reduce any voter to the position

of a uniform unit. They would rather that every man's intelligence, and the influence which he exercised, should also be taken into account. They wanted the preponderance of genius, and perhaps also the superiority of social power and hereditary influence, to be taken into account. Another point, with regard to which the writer of the paper had travelled into the region of speculation, was his recommendation of committees of the House of Commons elected by the voters, on whose decisions the House itself should merely say "Aye" or "No." That raised the old political question whether the House of Commons should merely be an executive body to register or reject decrees, or whether it should be a deliberative assembly. Questions which touched human feelings and the impulses of the human mind could not be brought to the absolute test of statistics; and, in his opinion, the discussion which the paper must tend to elicit was hardly one suitable to such a Society as theirs.

Major CRAIGIE said the Society was indebted to the reader of the paper for placing before them a great mass of facts in a compendious form, which might be useful in causing discussion. He did not, however, think that the Statistical Society was the best body to discuss the political deductions of this paper. They could not help seeing the particular line of political thought which ran through it, and gave it something more than a statistical colour. It was an attack on the basis of the present system of representation in this country. But the author had not been very careful in forming the groups of areas on which this attack was based, and on which new theories of representation were founded. The grouping which he had adopted struck him, on looking at the map exhibited, as singularly inapt. For example, Herefordshire and Lincolnshire were two of the most distinctively agricultural counties in England, and yet the author of the paper had so drawn his classification as to place them, as well as all the mountainous counties of Wales, in the "manufacturing" division. It must be misleading to mix up data for agricultural and mining districts, and group them with those relating to counties of a totally different and more urban character. Cumberland, Westmoreland, some parts of Derbyshire, and the Midland counties, were surely more agricultural than the thickly-peopled home counties immediately surrounding the metropolis. There was no attempt in this paper to give the different classes of employment in the different groups, distinguishing the persons employed in agriculture in the so-called agricultural counties from the whole population of those counties. It was assumed in the paper that the divisions marked out were more or less homogeneous, which was far from being even roughly the case. With regard to the statistics of wealth, the income tax assessment under Schedules A and B was rightly enough used as a local test, but he declined to accept the assessment to Schedule D as a local test at all. Schedule D was a very misleading test if taken geographically in the localities where trading profits were returned. Anyone who had looked at the Inland Revenue reports would know how often this had been

pointed out, and how, for instance, the enormous apparent wealth of the city of London consisted largely of assessments under Schedule D, such as those of the railway and other large companies whose head offices happened to be in the metropolis, while the possessors of that wealth did not live in London, and their income afforded no reason why Londoners should have more representatives. He questioned if they had any purely statistical basis for determining how localities should be represented. So far as he understood it, the theory of representation in this country was not the representation of persons at all, but of all separate interests and classes and phases of national life. Thus we had small boroughs and growing towns, the seats of special industries; and again pleasure resorts and seaside places, where the types of life represented were essentially different from that of a county or of a huge manufacturing or metropolitan borough. So long as each group was represented, the mere numbers in each group was of secondary importance. He wished to ask the author of the paper whether the statement that "the incomes from the ownership and occupation of land have increased at a great rate," was founded on the increase, as it appeared, of both Schedules A and B, or of Schedule B only; because the increase in Schedule A taught nothing with regard to the increase in the value of land, two-thirds of the total, and by far the most of the development, being made up of houses. He would also ask Mr. Ellis if he was right in taking as one of the bases of "responsibility" the amount paid by a district for the cost of its paupers. He should have thought that a big pauper bill was rather a reproach to a district than a credit. Those places which spent a large amount on pauperism were surely not, on that account, entitled to extra representation. Something might be said in favour of some relations between local outlays and representations for local authorities; but he protested against the pauperism of a district being held up as one of its titles to importance in the national scale. He wished that some estimate had been given of the revenues derived from different portions of the country, and the proportion of the representation to the taxes paid. He was quite sure if that were done, Ireland, at all events, would be found grievously over-represented. It was surely a matter of importance that the representatives in the House of Commons should bear some proportion to the taxes paid by the districts they represented. It was more necessary to consider this point, because the very class which was daily growing up more and more into political power, and to which some people desired at this moment to give yet further representation, was the very class which, of all others, paid the least share of the taxes. Labourers, and especially agricultural labourers, it had been repeatedly shown, whatever voluntary taxation they elected to bear by the consumption of dutiable articles, in proportion to their income paid now a vastly smaller proportion of the unavoidable taxation of the country than any other class of the community.

Mr. W. M. MILLER said he agreed that in the parliamentary representation of the country, numbers with knowledge and wealth, *i.e.*,

the possession of intellectual, real, or personal property, should be taken into account; but surely it was time that the House of Lords, which, as well as the House of Commons, consisted or should consist of representatives of the nation, might be supposed to represent somebody or something more than a few old and too often effete families. Major Craigie had spoken of the absurdity of considering that the districts which supported a large number of paupers should be allowed exceptional representation; but almost all the worst paupers of the empire seemed to flock to London; and if the people of London paid for the support of the scum of the nation, they had a good claim to additional and even exceptional representation; instead of which London had hardly any representation at all worth speaking of in a statistical point of view. It was too often said that the working classes paid very little into the national treasury, and on this ground a preceding speaker wished now to ignore their claim to more representative power; but they paid a tax on every glass of beer they drank, and unfortunately most of them might be set down as beer drinkers. Well, then, if representation was to go with taxation, working men were entitled to a large measure of representation in the imperial parliament.

Mr. R. B. MARTIN, M.P., said he was very much surprised to find that the west midland counties were, by the author of the paper, included in the manufacturing districts, because he himself represented a borough in the west midland which was a purely agricultural borough. The principles laid down by Mr. Ellis as the result of his figures would totally upset the whole of the existing representation in the House of Commons. For instance, Mr. Gladstone, who represented a Scotch county, would hardly like to be relegated to a Scotch committee, and to give his advice only on Scotch questions. The question that had been raised as to the proportion of Irish members to the whole representation of the House of Commons was one of very practical political importance, but it depended upon the Act of Union, and it would be very dangerous to deal with it unless the country was prepared to grapple with the Irish question in a far more thorough spirit than appeared probable at the present time. He thought that there was a good deal to be said in favour of collecting statistics of the various interests represented in the House of Commons, and no doubt careful study of the figures in the paper would show that they were of more practical value than could be detected at the first glance.

Mr. C. WALFORD said the tendency of the paper was in favour of numerical representation; but he regarded that as the very worst basis which could be adopted. It would reduce the House of Commons to a dead level of mediocrity. Every time there had been a change in that direction there had been a consequent deterioration in the mental capacity of the House. Small towns, middle class towns, and large towns had their separate interests, and in his judgment, if there were a hundred and fifty towns to be represented, it would be fair to give fifty members to each of those three classes. By that means all the different interests of the country would be

represented. No Government could be a Government in the proper meaning of the term, unless all the classes of the community were represented in it. If numbers alone were taken into account, variety of interests would be unrepresented.

Mr. J. GLOVER said it was true that questions brought before the Society were to be tested by statistical data, but he had never understood that in the use of those data readers of papers or gentlemen taking part in the discussion were to be precluded from giving to the Society the benefit of their views on political principles as they might be illustrated by statistics. Mr. Ellis had done nothing which had not been done scores of times in the Statistical Society. The last speaker had evidently forgotten that statistics existed with regard to the representation in the House of Commons before the first Reform Bill in 1832. It had been stated that in 1830-31 more than half the members in the House of Commons were elected by about a hundred and sixty individuals. When it was remembered that the House of Commons so constituted increased the national debt in one generation by 600 millions sterling, and kept the country at war for a great part of the time, he thought no one could deny that the public interests were not duly cared for under that system. In his opinion the Statistical Society ought to use the statistics which it obtained in illustration of political principles. The question of the representation of the people was not a mere question of symmetrical representation, as stated by a previous speaker, but a matter of right and principle. If an Englishman was taxed, he was entitled to be represented. He entirely agreed with Mr. Cohen, that the best system was that which the majority of the nation thought best for the time being; but had there ever been a time when the majority of men in England had had the opportunity of saying what they thought was best? The paper by Mr. Ellis was conclusive evidence that in the laws of England the most astute precautions had been taken to prevent the majority of the English people ever saying by clear vote what they thought. It was impossible to consider the figures put before them without coming to that conclusion. Previous speakers had referred to the extreme desirability of having a good representation of classes; but what did this mean? Were they prepared for class legislation? He had been under the delusion that for years the great object of legislation had been to frame laws in accordance with sound principles, and not in accordance with the prejudices of classes. If they advocated class representation, were they prepared for class taxation? If they were, then some classes would have to pay a great deal more than they did now.

Professor LEONE LEVI said it appeared to him that the function of that Society was pre-eminently to furnish the materials for legislation. In his opinion the paper was very opportune, because the subject with which it dealt was now more or less before the country. The principal materials required for framing a sound system of political representation were the progress of population, the geographical conditions of all its component portions and great

divisions, and the various interests, agricultural, manufacturing, and industrial, spread all over the country, and Mr. Ellis had supplied tables which would be helpful in the consideration of those points. Besides these, however, the comparative extent, strength, and power of the various elements throughout the country, from time to time, should be taken into consideration, as also the relative increase of wealth of the higher, middle, and lower classes, as well as the amount of taxation, direct and indirect, pressing upon them respectively. He wished that the author of the paper had favoured them with some comparison between the electoral representation systems of England and other countries, taking into account the educational and fancy franchises, including members of the universities, of scientific societies, of different orders of knighthood, of the civil service, &c. These were all elements to be taken into account in the consideration of any modification of the representative system of any country from time to time. He therefore thought that the Council had acted quite rightly in allowing the paper to be read.

Mr. H. R. DROOP thought that a better case for the existing system of representation might have been made out if the paper had distinguished between the rural districts and the small towns, and had shown that the small towns with representatives, represented not only themselves but also a number of other similar towns. But he did not believe that the existing system could long be maintained intact; and as any changes that might be made would necessarily be approximative to some arrangement on a statistical basis, he suggested that those who desired to avoid universal suffrage, should look out for and insist upon statistical principles that would lead to different results. Thus the question might be raised whether every person who had a vote should only have one vote. It appeared to him that the best way to prevent the extension of the county franchise from giving an overwhelming predominance to one particular class would be to give a larger number of votes to the wealthier classes, *i.e.*, to carry further the distinguishing process which at present gives the franchise to persons holding certain qualifications and refuses it to those who want these qualifications, by giving additional votes to electors above a certain level in wealth and position; and that seemed to him to be the only way in which the higher classes could be protected against class legislation in the interests of the more numerous lower class. He quite agreed with a previous speaker that legislation ought not to be influenced by class interests; but on looking at the proceedings of trades' unions, farmers' alliances, &c., he found that every class of electors looked upon legislation and political questions mainly from the point of view of their own interests; therefore the country must be prepared for class legislation if one class were allowed to have an enormous predominance in the representation. Another point which was worthy of consideration was whether the whole of the representation of a particular district should always be given to the party which happened to have a majority in that district. It was most illogical

that only half the electors in England should be represented in Parliament. As to this the speaker referred to a paper he had read before the Society in 1881.

The Rev. I. DOXSEY said that if the decision of the Council to admit this paper needed justification, it would be found by comparison of the representation of London with that of certain small boroughs in Ireland and in England. There were 22 small boroughs in Ireland the united constituencies of which amounted to only 8,732, while the metropolitan boroughs returned the same number of representatives, although they had a constituency of 351,836. It therefore appeared that 396 men of some obscure town in Ireland had the same political power as about 16,000 men in the great metropolitan boroughs. That showed how important was the consideration of the question statistically. One reason why Irish questions occupied so much time in the House of Commons, while those relating to 4 millions residing in the great metropolitan boroughs were set aside session after session, was that Ireland had 106 representatives in the House of Commons, while the city of London and metropolitan boroughs had only 22. Similar discrepancies existed in some small boroughs in England and Scotland, where there were a total of 20,638 electors returning 24 members, while some of the metropolitan boroughs, having from 40,000 to 50,000 electors, only returned two members. It was impossible to look at those facts without feeling that something must be done, and he did not think that the Statistical Society should be afraid to look this question fairly in the face. Aylesbury sent two members to Parliament, while its constituency only numbered 4,440, and Barnstaple also sent two members from a constituency of 1,785, while Lambeth with 54,000 returned but two. On what ground could this anomaly be maintained? Was there superior intelligence or were there peculiar interests in Aylesbury and Barnstaple to be represented? These facts were sufficient to convince everybody that this matter ought to be statistically considered. He hoped that the Society would have another paper on the same subject, carrying Mr. Ellis's conclusions still further.

Mr. DAVID NASMITH considered that when such a subject came before the Statistical Society it ought to be treated not merely from a political or partisan point of view, but on the principles both of ancient and modern times. That a redistribution of seats must take place before long was undeniable, and if such a redistribution was to be creditable to the nation, it must be upon some given principle. If the principle was to be that all persons should have equal voting power, then let statisticians tell what the result would be. If it was to be that every man should have a vote in proportion to the amount of income tax he paid, or if the number of votes was to be regulated by the amount which a man paid towards the maintenance of the State, that also was a subject with which the statistician could deal. In ancient Rome the latter principle was adopted, and he had never heard of a more equitable distribution of power.

Mr. H. T. W. ELLIOTT thought that the classification which the author of the paper had adopted was entirely incorrect, and it seemed to him that Major Craigie had done good service by pointing out some of the errors in that classification. If counties were classified and compared for statistical purposes, they ought to be properly described; and agricultural counties like Rutland and Lincoln ought not to be called "distinctively industrial." Again, Surrey was grouped with the agricultural counties, but it was well known that its urban population governed the representation. The population of Battersea alone was almost sufficient to swamp the representation of one of the divisions of that county. According to the paper, the number of electors in the metropolis was 337,000, and an extension of the county suffrage would not, of course, increase that number; but it would be interesting to know the relative number of voters which would be added to the agricultural and the industrial constituencies by the extension of household suffrage. He was of opinion that a considerable number of the new voters would be in the so-called agricultural districts. He also wished to ask the author of the paper whether he considered that the present House of Commons misrepresented the opinion of the country; for, apart from theory, he doubted very much whether at any time during the last fifty years an extended suffrage would have altered the general character of the House of Commons. He also thought that any proposal for altering the representation would be worth very little if it did not deal with the great question of the representation of minorities. In Birmingham, for instance, there were between 11,000 and 12,000 voters unrepresented. If an additional number of members was given to Birmingham, was it intended to provide for the representation of that minority? With regard to the comparative increase of the income tax under Schedules A and B, he would point out that the Schedule A assessments might be taken as practically correct, because the subjects upon which they were made were tangible and visible. But this was not the case as to Schedule D, which became more accurate every year, in consequence of the increased knowledge and experience of the officers charged with its assessment, and there thus existed, apart from its normal growth, an apparent tendency to increase. In any reconsideration of the question of representation, it should be remembered that a considerable portion of the taxation of the lower orders was indirect, and therefore any proposals based upon the payment of direct taxes were likely to be unsatisfactory to those classes.

Mr S. BOURNE thought that the Council needed no justification whatever for having allowed the paper to be read; for the statistical elements ought to have a very great influence indeed in determining political action upon such a subject. Every such contribution must necessarily at the outset be very imperfect, and be taken for what it was worth. He thought that the paper was deficient in that no statistics had been given with regard to the educational *status* of the voters. He looked upon the franchise as a matter not entirely of right, but of privilege and fitness for

the exercise of the power. That fitness depended very much on the educational qualifications of the various classes of voters. Mr. Glover's argument tended to the establishment of the very closest class representation that could be conceived; for if representation were to be based on numbers, the most numerous class would overrule the class which was best able to form a judgment on the points submitted to them. He thought that the representation of each class, in due subordination to numbers, was the true basis. The concluding paragraph of the paper was perhaps its weakest part. Nothing could be more fatal to the efficiency of a representative body than deputing the settling of details of measures to several committees, the members of which were chosen because they belonged to particular classes, leaving the whole House to simply affirm or negative. Another point alluded to was the small number of representatives which the metropolitan constituencies had in proportion to those sent by small constituencies, and that was a matter with regard to which statistical information would be useful, but still it was very defective. If they took the number of members in the House who owed their position to the fact of their being residents in the metropolis, they would find that the metropolis had a larger representation than any other district in the country. Mr. Martin, the member for Tewkesbury, had claimed to represent an agricultural community, but it was his position in the city of London which caused him to be elected for that borough. The intelligence, the wealth, and the power of the city of London were completely represented by the members who were chosen by many small places; and if the number of representatives for London was increased according to the number of voters it possessed, there would be an overwhelming preponderance which would be fatal to the interests of the country. There could be no question that a large amount of the taxation paid by the wealthy portion of the community was, in point of fact, paid by their dependents, or the persons whom they employed. If a man paid a large amount of revenue—say on beer consumed by his dependents—it was, in point of fact, paid by those who consumed the beer, because they suffered in their wages by having it given to them instead of money. In the same way there could be no doubt that the income tax which was collected in one particular place, was not wholly or principally due to that place; and the only safe mode of estimating the tax-paying community was to combine wealth and numbers together. He hoped it would not be considered that numbers or wealth were to be the great basis of representation, or any other one particular qualification. He doubted very much whether any probable alteration in the franchise would so far improve on the present system as to make it a more just representation of the whole interests of the community. What was wanted was that every class, and every section, should have the opportunity of making its voice heard in the great council of the nation.

The PRESIDENT, in proposing a vote of thanks to Mr. Ellis, said some criticisms had been passed upon the paper because of alleged

defects in it, and also on the ground that it was not a paper suitable for the Statistical Society; but as far as he could gather, the balance of opinion was entirely in favour of the view that it contained valuable materials, and that although it trenched upon the domain of politics, it was suitable for the Society to discuss. There really could be no question as to the suitability of discussing what might be called electoral statistics, and in doing so they must take into account the ideas which influenced politicians in fixing the basis of representation. It would be very singular indeed if such a statistical subject of great popular interest was not to be discussed in the Statistical Society. He could hardly imagine the use of the Society unless such topics were brought before them and discussed. It was quite unnecessary that there should be any partisan spirit in the matter. The great fault of many political discussions was that there was unbounded exaggeration on both sides; but it might be hoped that within the walls of that Society only the purely scientific aspect would be dealt with. The chief use of the paper seemed to him to be that it brought to notice the changes in those elements which were usually held by politicians to determine representation. There could be no doubt that to a large extent population was one of the elements which guided politicians. He would express no opinion as to the right or wrong of that, but at least one great nation—the United States—had deliberately adopted the principle of numbers in determining the representation for one House of the Legislature. They had also an automatic system by which every ten years the representation was changed according to the change in numbers which had taken place. Such a state of things fully justified the discussion of the numbers of population, when dealing with electoral questions. In former discussions also some consideration had been given to the principle of wealth in determining the representation. If some districts had grown in importance in point of wealth, and presumably also in point of taxation, then it had been considered that they had a sort of title to increased representation. At any rate, it was desirable that the Society should see from time to time what changes were taking place in those factors, and in this respect the paper was a very valuable one. It showed that between 1871 and 1881 very great changes had taken place in those factors, and whatever opinion might be held with regard to them, it was very interesting to have them brought before them. He hardly agreed with the criticisms which had been passed upon the grouping which Mr. Ellis had adopted. Any grouping of that kind was necessarily a matter of discussion, and he would appeal to the experience of Major Craigie himself with reference to other matters where a geographical division seemed more easy, but where it was found in practice difficult to make a satisfactory division. Although Mr. Ellis had called one of his divisions agricultural and another manufacturing, he apprehended that that was only for brevity's sake, for the division was essentially a geographical one, Scotland being one of the divisions, Ireland another, and England being divided into three. No such grouping could be very exact in itself, but if it could be put in such a way as to bring the facts broadly

before them, he thought the division for many rough practical purposes would be found very useful. Some of the speakers had suggested that a great deal more might have been put into the paper, and it was quite evident that Mr. Ellis might have shown them exactly how far, following the principle of population, changes might be made in the existing representation, and how far, following the principle of wealth and taxation, changes might be made; but to say that a paper did not do more than it did, when it had done very good work up to a certain point, was not to pass a very effective criticism upon it. They ought to be thankful for what they did get, because the time which could be devoted to the preparation of such papers was in most cases very limited indeed, and if they received a valuable contribution of any kind, they ought to accept it, and not be too critical about it. No doubt the point that Mr. Bourne raised with regard to education was very important, but the absence of that point in the paper could scarcely be regarded as a defect when it included so much of great value.

The vote of thanks having been agreed to,

Mr. ELLIS, in reply, said that one of his reasons for not further pushing his individual construction of the facts set before the Society, was, that he might thereby lay himself open to the charge of political bias.

MISCELLANEA.

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I.—Financial and Commercial History of 1882.

THE following is taken from the Supplement to the *Statist* of the 27th January, 1883, in continuation of similar extracts for previous years—commencing with the year 1878:—

“The principal financial event of the past year has been the collapse on the Paris Bourse, which had been impending for some time at the date of our writing the last annual history, and which had then fairly commenced. Immediately after we wrote the agony of the crisis was reached. A few days after, in consequence of the large withdrawals of bullion from this side to support the Paris market—very nearly 2 millions being taken in one week—the bank rate here was advanced to 6 per cent. The state of affairs in France had no doubt become very serious. The bourse at Lyons was altogether shut up for some time, and although no such extreme measure was found necessary in Paris, yet the difficulties which arose were only surmounted by the greatest patience and the most energetic efforts on the part of the banking and financial houses in that capital. A formal suspension of payments on the Bourse was avoided; but to a large extent there was a virtual suspension, many people obtaining time in order to make good their losses and pay their debts. This great event has had many and far-reaching consequences. The ‘liquidation’ throughout France, not only on the Stock Exchange, but in some other departments of business as well, has been continued throughout the whole year. Business, as a whole, has declined in France, and with it the revenue of the Government, which, after several years of very great prosperity, has been involved in serious financial embarrassments; the budget now showing a considerable deficit, and the Government having great difficulties with an unmanageable floating debt, while the last loans issued to maintain the expenditure on public works are found not to be placed. Contrary, however, to the expectations we were inclined to entertain at the time we wrote a year ago, there have been no great financial events during the year resembling the collapse on the Paris Bourse. The nearest approach to any such

event was a collapse in some departments of the Stock Exchange in the course of the summer and early autumn, in consequence of the Egyptian crisis. The insubordination, and finally the actual rebellion, of the Egyptian colonels all through the spring and summer kept the Stock Exchange for a long time in an apprehensive condition, the fear being that not only might the state of affairs in Egypt affect Egyptian stocks more particularly, but that there might possibly be a rupture between France and England, if not between those countries and other European Powers. When it at last became evident that there were serious difficulties between England and France, and that the conference of the ambassadors of the Powers at Constantinople was not meeting with success, while the attitude of the colonels led to such incidents as the massacre of Europeans at Alexandria and the bombardment of Alexandria by the English fleet, the apprehension on the Stock Exchange culminated in a semi-panic. Egyptian, Turkish, and other stocks were discovered to be rather weakly held in large masses; forced sales had to be made; a few heavy failures on the Stock Exchange occurred, and for some time there was great fear of a general Stock Exchange panic and collapse. Eventually, the area of the troubles proved to be somewhat limited, the panic being mainly in Egyptian stocks, and there being no general crisis at all to be compared with the crisis on the Paris Bourse which had occurred a few months before. But with this exception, there have been no great financial events. The effect of the Paris collapse seems rather to have been sedative than otherwise; caution has been widely diffused; there has been a slow reaction against the inflation of the last two or three years; but there have been no great events such as we should look for when a period of great speculation suddenly comes to an end.

"The general result is that the business character of the year 1882 has been rather peculiar. Judging by the ordinary tests, and surveying the year as a whole, we can have little cause to doubt that it has been a fairly prosperous year. The returns of railway traffic, of imports and exports, of shipping, of the production in the chief trades, and of the consumption of articles like tea and sugar, all show a moderate increase upon the previous year, which had undoubtedly been the most prosperous of any of the years which have elapsed since 1873, and was really a very prosperous year. Still, all through the year, and increasing as the year approached its termination, there has been a feeling of weakness and a want of animation of the most decided kind. Apprehensiveness on all sides has induced caution, and the result has consequently been that while the year, as a whole, has been satisfactory, the largest amount of business was done and the largest amount of profit earned in the earlier months. This dragging character of business has lately been marked in the prices of the leading commodities. In almost all the main articles there is a reduction of price. Scotch pig iron, which was close upon 50s. per ton in January, and which, after falling to nearly 47s. in April and May, rose again to 50s. in the autumn months, finally fell below 49s. at the end of the year, and has since further fallen to about 48s. Copper (Chili bars) has

fallen from about 66*l.* 10*s.* per ton to 65*l.* 5*s.*; Straits tin, from 112*l.* 15*s.* to 93*l.* 10*s.* per ton; tin-plates, from 23*s.* to 22*s.* per box; lead, from nearly 15*l.* per ton to 14*l.* 3*s.* 9*d.*; and spelter, from 17*l.* 15*s.* to 16*l.* per ton. Among the raw materials of textiles, again, we find that cotton (middling Uplands) has fallen from 65*d.* per lb. in January to 5 $\frac{3}{4}$ *d.* per lb.; jute, from 16*s.* 6*d.* to 12*s.* per cwt.; silk, from 17*s.* 6*d.* to 16*s.* 4 $\frac{1}{2}$ *d.* per lb.; and although Australian wool has slightly risen, it is found that English wool has declined, and is now at a lower price, it is believed, than it has been for very many years. Among articles of general consumption, also, it is found that wheat has fallen in price from about 46*s.* 3*d.* to 41*s.* 6*d.* per quarter; coffee (Ceylon), from 63*s.* 6*d.* to 61*s.* 6*d.* per cwt., and (Brazil) from 50*s.* 6*d.* to 44*s.* per cwt.; sugar, from 19*s.* 6*d.* to 18*s.* 3*d.* per cwt.; and tea, from 5 $\frac{3}{4}$ *d.* to 4 $\frac{1}{2}$ *d.* per lb. There have been some few instances of great advance in price among commodities; but these are chiefly in minor articles, such as hops, where the increase in price has, indeed, been most remarkable—namely, from 4*l.* 4*s.* per cwt. in January to 28*l.* per cwt. in December. It is thus evident that business has been dragging during the latter part of the year, and the fall of prices has, no doubt, affected most injuriously the profits of merchants generally, besides conducing to not a few mercantile embarrassments, of which several failures at the end of the year in the iron and tin-plate trades, and a few similar failures which have occurred since, have been the unmistakable signs. If any further evidence were wanting of this dragging trade, it would be found in the statistics of the exports, which show a considerable increase for the whole year, but a steadily decreasing rate of increase in the spring and summer months, and finally, in the last two or three months of the year, a decided decrease, culminating in December in a decrease of 10 per cent. The falling off is, no doubt, found, on examination, to be partly due to the reduction of price which we have already noticed; but there has, nevertheless, been some decrease in the quantities exported also. Similarly, the increase in railway traffics was lowest in the last quarter of the year, and was practically only nominal in December. While, therefore, there is no doubt that the year 1882 was fairly prosperous taken as a whole, yet the fact of a turn in the tide having taken place during the course of the year must be observed. We should have inclined to anticipate beforehand more events and greater prosperity; but for some reason or other the financial crisis of the early part of the year seems to have been quite enough to check speculative business. The check once given, various other incidents have occurred to assist it, such as a pause in the gigantic railway construction and general material development of the United States, which has led to a diminution of our exports to that quarter. Without any more events, therefore, than those we have described, there has been a considerable reaction in business, so that the year 1883 opens less promisingly than its predecessors for at least three seasons past.

“Keeping in mind this general character of the year as we have described it, we shall now proceed to notice in detail some of the main business features of the year.

“The Iron and Shipping Trades.”

“As we had to notice in our previous histories, the revival of trade which began in the autumn of 1879, and the prosperity which has since continued, were both largely connected with the special improvement in the iron trade, and this improvement, taking the year as a whole, seems to have continued during 1882. The production of pig iron in Great Britain in the year has been estimated in Messrs. Fallow's Circular, which we append, at 8,450,000 tons, which exceeds by about 70,000 tons the vast production of the year 1881, and, of course, exceeds still more the production of any previous year. Similarly, it is found that the total exports of iron of all kinds in 1882 greatly exceeded those of any previous year, the total being 4,350,000 tons, as compared with 3,800,000 tons in 1881. The home consumption, also, is greater by 100,000 tons than in 1881, the total being 4,415,000 tons. Thus, while the production has been larger than in any previous year, both the foreign and the home consumption seem to have increased still more—a condition of things which apparently combines circumstances of the greatest prosperity. Looking, also, at the home consumption in detail, it is found that the tonnage of shipping turned out in the year amounts to the large figure of 1,195,000 tons. On the Clyde, the increase of 1881 over the previous year in the tonnage is 54,000 tons; while on the four northern rivers—the Tyne, Wear, Hartlepool, and Tees—the increase has been 114,000 tons, and the total increase of all these ports has been over 20 per cent. beyond the unprecedented out-turn of 1881. Such figures show the great magnitude of the demand for iron which has existed. The reports, moreover, speak rather hopefully of the existing state of the order books of the ship building firms, and there seems no likelihood for many months to come of any falling off in this department of the consumption of iron. Reports in the engineering trade are equally satisfactory, while it does not seem as regards shipping that, as yet, there is any material fall in freights as compared with those which ruled in the earlier part of 1882. The reaction in the iron trade which has undoubtedly been felt during the last few months is thus, at first sight, somewhat difficult to account for. It appears, however, that the trade has been specially affected by the falling off in the demand from the United States, this falling off being all the more significant from the fact that the production in the United States in 1882 is estimated to be somewhat less than it was in 1881, so that the home demand in the United States altogether must have considerably diminished. There is no doubt, indeed, that the diminished purchases of the United States, not only in the iron trade, but in other trades in this country, have assisted very materially in the reaction of the last few months. At present, however, it would seem that the iron trade is again rather more cheerful than it was at the end of the year. The apprehensiveness in the United States would seem to be itself diminishing, while the other demands on the iron trade at home—namely, from the home consumption here itself and from other foreign countries besides the United States—seem rather to be increasing.

“The prosperity in the iron, engineering, and shipping trades is the more remarkable on account of the special depression in the tin-plate trade, which has led, as we have already noticed, to several failures at the end of the year. There has, however, been a large amount of speculation in this trade, accompanied by speculation in tin itself; and although the prosperity of the tin-plate trade contributed some two or three years ago to the general prosperity of the iron trade, it does not seem to be a large enough trade now by itself for its adversity to affect sensibly the general volume of the prosperity in the iron trade.

“Coal, as well as iron, has been in great demand during the year, and it will undoubtedly be found, when the statistics are made up, that the enormous production of 154 million tons in the year 1881 has been increased in the year 1882. The exports from the port of Cardiff alone have been close upon 6 million tons, or about a million tons more than in 1880. Coal has also somewhat risen in price during the year, contrary to the general tendency in most wholesale commodities.

“The Chemical Trade.

“The chemical trade has been very dragging through the year; but lately the tendency again is towards improvement.

“The Textile Trades.

“In the textile trades, and particularly in cotton, the course of business during the year has been very interesting. The active state of business in the cotton trade, and the apprehensions of a scarcity of the raw material in the early part of the year, maintained prices all the time that the Manchester market was in an unsatisfactory state, in consequence of the eastern and other markets having been rather over supplied. The result was, in the latter months of the year, a considerable amount of depression in Lancashire; the margin between the price of the raw material and the manufactured article was for a considerable time most insufficient, and there was a great falling off in the shipments of cotton manufactures, this being one of the causes of the decline in the exports shown in the Board of Trade returns in the latter months of the year, which we have already noticed. More recently, however, as the weekly reports in our ‘Business Week’ have shown, matters have been somewhat improving on account of the very low price to which cotton has fallen. The rise in cotton early in the year, notwithstanding a somewhat deficient crop in the United States in 1881, was checked by a large supply from India; but now it would seem the American crop of 1882 was unprecedentedly large, while the diminution of production, in consequence of the slackened demand from the East, still further helped the fall in the raw material. Now the raw material is at so low a price that manufacturers are tempted into the market. According to one of the circulars, which we append:—‘Prices of American are now almost as low as they have been at any time during the last twenty-five years, except in the panic of 1878-79. Middling Upland on the spot is quoted 5 $\frac{3}{4}$ d. This is below the average price of any year

since 1854, even including the panic year above referred to. It is to be hoped that the present low range of prices may be of longer duration than has generally been the case, for spinners have gradually worked themselves into a better position than for a long time past, and there is now a satisfactory margin for profit, so that the chances are in favour of a full and probably of an increased consumption throughout the year.' So far as this year has gone, the prospect just referred to appears likely to be realised.

"With regard to wool, the peculiarity has been that while Bradford has continued depressed, and the price of homegrown wool, which Bradford specially consumes, has fallen, yet the general circumstances of the woollen trade have not been unsatisfactory. According to the circular of Messrs. Helmuth, Schwartz, and Co., it is estimated that the raw wool consumed in the United Kingdom amounted in 1882 to 357 million pounds, as compared with 320 million pounds in 1881, and, allowing for changes in the character of the wool worked up, the real quantity worked up by English industry is considered to have been the same in 1882 as in 1881. There has, consequently, been a large business in the woollen trade in the past year, and although the reports speak of it as stationary, yet it must be considered that it is stationary at a comparatively high level. All that is noticed in the circulars is a remarkable absence of buoyancy, and although this is a material thing as regards the profit of the merchants and traders, it is not so material for the general prosperity of the country. The summing up of Messrs. Helmuth, Schwartz, and Co., is very interesting. They say :—'It is not of want of activity that the industry in England, France, and Germany has had to complain, nor dearthness of the raw material, nor of outward unfavourable influences. The difficulty which has prevented improvement has lain, and lies still, in the excessive competition within the trade, and the consequent absence of that amplitude of profits which constitutes prosperity, and without which no real buoyancy is possible.' They think however the prospects of the new year favourable, basing this opinion partly upon the probability of a stationary supply from Australia and the River Plate States, and partly upon the fundamentally sound position of the article. 'Its value,' they say, 'is, and has been for some time, essentially moderate, the rate of consumption is fully up to that of supplies, and we think for these reasons that wool is likely to hold its own, and to respond easily, should, through the influence of the fair harvests of last year or from other causes, the general trade receive a fresh impetus.'

"The silk trade is reported to have been specially affected by the financial troubles in Lyons and Paris, the whole of the continental silk trade having, in fact, been disorganised. At the end of the year, however, there was a more hopeful feeling, and it is believed that 'with the present moderate range of prices there can be little chance of mischief, and a fair ground for expecting an improved result to bold and careful trading.'

"In the linen trade also there has been a dragging business, and great disappointment that the hopes of improvement now and again held out have not been realised. Messrs. George Armistead and Co.

say:—‘As the summer wore on, hopes were again revived by the prospects of a favourable harvest this year. These hopes have to some extent been realised, but the effect has only been to prove that after a succession of bad harvests it will take more than one good one to restore activity into the home linen trade. Fortunately, the export of linens has been pretty well maintained.’

“In jute, as already noticed, there has been a remarkable fall of price during the year, which is stated in the circulars we append to have been without a parallel in the annals of the jute trade. This fall of price however has been brought about by two large crops in succession, and not by any falling off in consumption or event of that sort. The result has been that the price in August last (the opening of the season) was about 23 per cent. below the average of the opening prices of former seasons during the past twenty years. Even these rates, however, did not induce speculators to operate, and prices shortly after fell, week after week, till the fall at the end of the year is over 30 per cent. from the low prices at the opening of the season in August, which, as we have seen, were 23 per cent. below the average of the opening prices of former seasons for twenty years. The result however is that the enormous consumption of 1881-82, which amounted in Europe to 313,000 tons, or 60,000 tons more than in the previous year, is likely to be exceeded in 1882-83.

“Miscellaneous Trades.

“In the miscellaneous trades—hides, indigo, rice, sugar, tea, and other articles, which are all fully described in the circulars appended to this history—there is comparatively little to notice, the same features of reaction and of fall in prices being almost universally noticeable, along with the facts of large consumption and turnover during the year. With regard to sugar, it is noticeable that the estimated home consumption is larger in 1882 than in the previous year, and, allowing for the export of British refined, is almost exactly a million tons per annum. Here again it is over supply, rather than a falling off in consumption, which has caused the reaction in price. Messrs. Patry and Pasteur say:—‘The present low prices do not seem to affect the prospect of supplies for the coming season. Generally speaking, if Europe is losing her grasp over the Cuba and West India crops, supplies from the East are not likely to fail; whilst the production of beet sugar is steadily increasing, particularly in Germany, where the premium arising to the fabricants out of the present mode of levying the excise and returning drawback on export is increasing the number of factories to such an extent that the producers themselves are agitating for a reduction of the bounty. The deliveries of sugar on the Continent, on the other hand, are hardly showing any increase, except in France, where the reduction of the duty carried out in October, 1880, is still acting favourably upon the consumption.’ With regard to tea the statements are most remarkable. The price last year appears to have been lower than ever before known—15 to 20 per cent. less than the lowest in 1881, which was thought then to have marked the minimum point. The opinion in the city seems

to be that the general trade depression accounts for the low prices ; but it would rather seem that the main cause is the continuous and increasing supply, which the trade circulars also refer to. It is stated that early and hurried supplies from China added to the heavy stocks in the warehouses at the end of May last, while the growth of the Indian export from year to year exercises a marked effect upon the value of all good and fine China teas, more especially as the consumption of the former kind is largely on the increase. This increase of the import of Indian tea is indeed the characteristic feature of the tea trade, the amount in the past year having reached the large figure of 54 million pounds, against 45 million pounds in 1881, and 36 million pounds only about five years ago.

“ The Harvest.

“ We have passed over almost altogether the effect of the home harvest on the general trade of the year. The reason is, however, that the harvest having been of an average kind, its effect upon the home trade has not been conspicuous. For some years, as we have contended, the question of the home harvest has not had the economic importance it used to have formerly, when deficient crops at home were necessarily followed by high prices for food, leading to the impoverishment of the masses, so that the whole prosperity of the country was affected, the masses of the people having less to spend in the purchase of manufactures and articles of general consumption besides food, and there being consequently a diminution of prosperity which spread from one trade to another. On the other hand, when harvests were abundant the working masses had cheap food, and had a large surplus to spend in other directions. Now, however, the surplus of the masses is quite as much affected by foreign as by home harvests ; and as the price of food has been low, the fact of the deficient home harvest has not had the effect in checking prosperity, as the fact of an abundant home harvest would not have had the effect in stimulating prosperity, that such harvests would formerly have had. It is undoubtedly true however that the home harvest is an item in the general prosperity. Home agriculture is one of the largest of our trades, and anything that affects the welfare of the industry must to some extent affect the whole community. It is found, however, that during the past year the cereal harvest was under the average, or slightly under the average, so that as regards it there is no particular consequence in the general industry of the country to be noted. Although there are no details regarding the other agricultural productions of the country, it would seem that the result has also been moderately satisfactory, and consequently, without any particular effect upon the general adversity or prosperity of the country. If the harvests had been greatly below the average, the additional depression would no doubt have intensified the reaction of the latter part of the year ; while if they had been greatly above the average they would have counteracted the depression. As matters stand, the record as regards the agricultural industries of the country, like that of so many of the manufacturing industries, is that of stationariness and only moderately satisfactory results. Unfortunately, the prospects of agri-

culture in the United Kingdom during the year upon which we have now entered appear to be much less promising than they were for 1882.

“The Money Market.”

“Business having been really fairly prosperous during the past year, the various institutions of credit connected with the money market have also been fairly prosperous. This follows from the fact that the bank rate, and with it the rate of interest in the open market, have been moderately high, and that a considerable business has been done at these high rates. It is quite true that the turnover in the latter months of the year must have been less than at the beginning of the year. In these latter months the Bankers’ Clearing House Returns show a very large decrease, and this means undoubtedly that the turnover which benefits banking and financial institutions has been less than it was. This contraction of business, however, must likewise have been on a comparatively limited field, being chiefly felt upon the Stock Exchange, inasmuch as it is on the Stock Exchange settling days that the greater part of the falling off in clearing house business has occurred. It is found when the bank accounts are examined at the end of the half-year, that neither the deposits nor the discounts and advances have fallen off compared with what they were a year ago. The banks and discount companies at least have consequently gained by the general circumstances of the money market; and the fact that they have gained is one sign amongst others that the contraction of business in the latter part of the year has not gone very far. If there had not been some contraction, banking profits must have risen very considerably, even above those of the year 1881, but as it is the banks have no reason to complain. There may have been a few bad debts in some quarters in connection with the one or two heavy failures at the end of the year, which we have already referred to; but these failures do not seem to have affected generally the profits of the London banks and discount companies.

“The financial incidents of the year have been comparatively few. Among the more important, in addition to the collapse on the Paris Bourse and the semi-panic on the Stock Exchange before the outbreak of the Egyptian war, already noticed, was the great issue of the shares of electric lighting companies in the early part of the year. Since these issues, however, the money market has been comparatively quiescent, with hardly a single event to disturb its course. It became necessary early in the autumn to advance the bank rate, which remained for a long period afterwards at 5 per cent.; but after that, business continued quiet, the reaction which had set in upon all sides tending slowly to make the 5 per cent. effective, and to rectify the position of the banks, so that at the time we now write, the tendency in the money market is most decidedly downwards. There can be no doubt that, as compared with the state of things a year ago, the money market is strong. As we pointed out in a recent article, the Bank of France has accumulated about 12,000,000*l.* of gold in the course of the year, and the Bank of Germany over 2,000,000*l.*, while the bullion in the Bank

of England is also rather larger than it was. At the same time the monetary situation in New York, which acts so powerfully upon this market, has become easier. Very little gold went from Europe to the United States last autumn. The contraction of business in the United States has thus been as effective as the contraction of business upon this side. Altogether, then, the quiet of the latter part of last year has been most beneficial in restoring equilibrium to the money market, and relieving the situation which a twelve-month ago was somewhat dangerous.

“Permanently, however, the condition of the New York money market is not without cause for apprehension. That market is now governed by the process of paying off debt, which interferes greatly with the note circulation of the national banks, and causes a continuous contraction of the currency. The banks, as we have often explained, are only allowed to issue notes against a deposit of Government securities of more than equivalent amount, and as these Government securities are being rapidly redeemed, while the rate of interest has become very low, it is found increasingly difficult for the banks to obtain or keep the securities which it is necessary for them to deposit, in order to secure their circulation. The circulation of the New York banks alone, during the past year, has fallen off more than 10 per cent.—namely, from about 4,000,000*l.* to 3,500,000*l.* sterling. And this contraction of the circulation seems likely to become even more pronounced during the next few months and the next two or three years. In spite of the reckless way in which money has been voted by Congress, the accruing surplus in the United States treasury remains very large, so that the outstanding bonds of the Government become fewer and fewer month by month. What the end will be it is difficult to forecast, though the probability is, of course, that as the necessary effect of the present process in contracting the note circulation of the banks becomes visible to Congress, some new banking and currency legislation may be tried. We can hardly believe that the United States people will be content to do without a bank note circulation of some kind, while there is no means within the lines of the constitution for an expansion of the greenback circulation. If, however, no such legislation is attempted, and the present arrangements are unchanged, what we have to look forward to is a gradual contraction of the United States bank note circulation, and the substitution therefor of other currency, which, in the present case, must be almost exclusively a gold currency. At present, while the Bland law remains in force, the void made by the contraction of the bank note circulation may be filled up by the issue of the Bland dollars to the extent of 5 millions sterling per annum, these dollars being made available for general purposes by the issue of what are called silver certificates of deposit. But this issue of silver certificates cannot be depended upon permanently, being viewed with great disfavour by banking and political authorities in the United States. Unless something is done, then, a renewed demand for gold for the United States is quite likely before long. Altogether, the situation is very complex on the other side of the Atlantic, and its development must be watched here with very great care.

“ There are two other incidents in the history of the money market to be noted. The first is the completion of the arrangement for the resumption of specie payments in Italy, that resumption being now fixed to take place very soon. Italy has now found all the gold required for the purpose, which included, it will be remembered, not merely arrangements for making the paper money convertible, but for cancelling a large amount of the small note circulation. The matter has lost the interest it once had, the disturbance of the money market, which it was feared the Italian requirements would produce, having almost all taken place in the year 1881. Still, the fact that Italy has been able to resume specie payments without disturbing the money market more than it did, deserves to be noted. As the result of all the monetary events of the last two years, there has undoubtedly been a partial fall in the prices of commodities, but it cannot be said that business has in any way been materially hindered or injured. Speculators may have suffered, just as they gained largely by the great advance in prices in 1879 and 1880; but general business has gone on much the same, while fall of prices has apparently benefited many departments of trade, and increased the profits of the steady-going merchant and manufacturer. The other event we have to notice is the fall in the price of silver which has occurred during the year, this fall being almost exactly 2*d.*, namely, from 52*d.* to 50*d.* per ounce. As might have been expected, the event has renewed the clamour of bimetallists and others, though it seems nothing more than the natural consequence of the general contraction of business to which we have referred. It still remains true that silver, as regards gold, though in this market it is only a commodity, is less fluctuating in price than other commodities are, and certainly a change from 52*d.* to 50*d.*, or about 4 per cent., is no such fluctuation as ought to alarm or injure any merchant engaged in sound business. The real dangers against which merchants have to guard are not such fluctuations of exchange, but dangers of loss from bad debts and miscalculations respecting markets. It remains to be seen, moreover, whether this fluctuation is not a very temporary one, and whether there may not be a renewed recovery in silver as the money market here becomes easier, and trade once more becomes active. The steadiness of silver for a long period between 51*d.* and 52*d.* was certainly most remarkable, and in every way a confirmation of the view that there was no need to be excited about silver, and that its steadiness in relation to gold was a thing which could be depended upon if there was no artificial interference. The comparatively rapid fluctuation which now has taken place does not alter this view. If silver only remains as steady during the next few years as it has done in the last two or three years, bimetallists will have no practical argument for altering the present state of things. It will be proved to the satisfaction of all reasonable men that interference is uncalled for, and that the prices of silver and gold, like those of other commodities, may be left to take care of themselves.

“ *Conclusion. The Prospect of 1883.*

“ The description of the past which we have given contains

implicitly a forecast of the future. If the view is correct that business has been fairly prosperous during the past year, as seems to be undoubted, and that only a partial reaction has been in progress—of which the result has also been that prices have been considerably reduced and the money market strengthened, so that altogether there is a sounder platform for the ordinary transactions of business than there was—then in the course of the present year there ought to be renewed improvement. If credit had been greatly shaken, so that a further and serious contraction of business was to be apprehended, it would be impossible to look forward to the immediate future with confidence. In point of fact, however, credit has not been shaken. The fall of prices has been brought about gently, and without shock, simply through the ordinary operation of the higgling of the market, in the absence of any great speculation either at the beginning of the year or at the end of it. There have, no doubt, been some forced sales owing to stocks being held with borrowed money; but, on the whole, these forced sales cannot, in the aggregate, have been large, so that the fall of prices has not had the effect it would otherwise have had, of giving a severe shock to credit. The greater part of business all through the year has been hand-to-mouth business, and the changes which have happened are thus almost altogether in favour of the profitableness of further business. The volume of business transactions remains as it was a year ago—very large. And this is the condition most favourable to producers and consumers, when prices, as they now are, are moderately low. The recovery seems also very likely to be general. There has been contraction and reaction in the United States as well as on this side, extending over many months, and apparently in the United States almost from the middle of 1881; but this general contraction seems at last to have put business everywhere on a sounder basis, and the tendency in the United States, as well as here, seems to be once more towards improvement. Much will depend, of course, upon the harvests of the coming season, on which it is yet quite premature to speculate. It may be quite true that up to this time the conditions in this country have not been favourable for the next harvest as regards grain crops, more particularly wheat; but it would be unsafe to conclude from this that the chances for next season, even in this country, are altogether adverse, seeing how much more important are the root crops and the grass. Until, then, the season is more advanced, we may remain in hope. In spite of bad harvests in this country for a good many years in succession, there has probably never been a period of depressed agriculture through which the country, as a whole, has ever passed as easily. The width of the area from which our agricultural supplies are drawn, and the interdependence of so many countries, commercially and industrially, almost ensures that on the average the agricultural result of the year will be a favourable one; and a very small turn of the scale in the right direction would make the result highly favourable. The great point, however, as regards the future, is that prices and wages are low, and that the money market tends to be easy, while credit remains unshaken. After a little time, these conditions

ought to produce a renewed improvement in trade. The truth is perhaps that, since the revival of trade in 1879, there has been no time for credit to be undermined ; consequently, any reaction which takes place—and trade must always be liable to ups and downs—can only be partial. We must wait for some time yet before such a reaction will bring with it a great shock to credit and a lengthened paralysis of business activity.”

The Index to the Supplement is appended, as on former occasions :—

Introduction.

The Iron and Shipping Trades—The Chemical Trade—The Textile Trades—Miscellaneous Trades—The Harvest—The Money Market—Conclusion—The Prospect of 1883.

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II.—*A Note on the Statistics of Wine Production in France.* By A. E. BATEMAN, *Hon. Secretary of the Statistical Society.*

[A Paper read at the Nottingham Congress of the National Association for the Promotion of Social Science, September, 1882.]

LITTLE apology is needed, I think, for introducing this subject to the notice of the Economics Department of the Congress, con-

sidering how closely the wine interest of France is bound up with our own trade with that country, and how important to many of us as consumers is a sufficient supply of wholesome and cheap wine. The following table shows that the vineyards of France at the present time cover an area of 2,100,000 hectares, or nearly 5 millions and a quarter acres, and the production of grape wine was last year 34 million hectolitres (750 million gallons), which, at a moderate estimate of 30 frs. per hectolitre, would amount to an annual value of 1,020 million frs., or about 41 million sterling. This is about half the value of the annual wheat crop, but is greater than any other single agricultural industry.

TABLE A.—*Extent of Land under Vine Cultivation in France, and Quantity of Wine Produced in each of the Years from 1871 to 1881.*

Years.	Number of Hectares under Cultivation.	Quantity of Wine Produced.
	Hectares.	Hectolitres.
1871	2,369,484	56,901,000
'72	2,373,139	50,155,000
'73	2,380,946	35,716,000
'74	2,446,862	63,146,000
'75	2,421,247	83,836,000
'76	2,369,834	41,817,000
'77	2,346,497	56,405,000
'78	2,295,989	48,720,000
'79	2,241,477	25,770,000
'80	2,204,459	29,677,000
'81	2,099,923	34,132,000

It appears from this table that the area under vines has considerably decreased during the last few years, more than half a million hectares (1,400,000 acres) of vineyards having been totally destroyed by the phylloxera. The production of wine, moreover, has diminished in a still greater ratio, having fallen from an annual average of 50 million hectolitres (1,100 million gallons) for 1871-80, to 34 million (750 million gallons) in 1881.

While the depredations of the phylloxera have been almost universal, some departments have suffered much more severely than others, and among the greatest sufferers are the Gironde, Lot et Garonne, Haute Garonne, and other departments in the south-west. On the other hand, in a number of departments still comparatively uncourged, and where the vines can be planted in sand, an impetus has been given to the production of wine by the increased price.

The distillation of brandy from grapes—an important source of profit—has been even more injured by the phylloxera than wine making. The following table shows the annual production of spirits from various substances for the last ten years:—

TABLE B.—*Quantity of Alcohol Produced in France in each of the Years from 1871 to 1881.*

Years.	Alcohol derived from the Distillation of					Total.
	Farinaceous Substances and Potatoes.	Molasses, Native, Foreign, or Colonial.	Beet Root and Extract of Beet Root.	Wine, Cider, Husks of Grapes, Lees, and Fruits.	Various Substances.	
	Hectol.	Hectol.	Hectol.	Hectol.	Hectol.	Hectol.
1871	125,652	547,618	391,583	466,643	69,599	1,601,093
'72	79,432	619,246	281,693	851,374	57,439	1,892,184
'73	100,505	710,646	322,828	225,728	62,809	1,422,516
'74	136,034	687,541	372,788	276,176	59,182	1,532,021
'75	100,495	651,947	369,263	717,732	9,555	1,848,992
'76	101,402	710,670	243,337	645,837	7,929	1,709,175
'77	163,204	642,709	272,883	224,289	5,796	1,308,881
'78	180,469	646,715	331,716	254,831	3,496	1,417,227
'79	247,171	723,631	364,714	147,185	5,178	1,487,879
'80	412,585	685,433	429,878	48,514	4,658	1,581,068
'81	506,273	685,646	563,240	61,839	4,289	1,821,287

It thus appears that while the total quantity of spirits produced in France was last year 1,821,000 hectolitres (40 million gallons), as compared with 1,580,000 hectolitres in the ten years 1871-80, only 62,000 hectolitres, or about $3\frac{1}{2}$ per cent., are now produced from wine, &c., as compared with 25 per cent. in 1871-80. Beet-root and potatoes have supplied the deficiency, the so-called brandy distilled from them being now nearly 60 per cent. of the whole, the remainder being chiefly made from molasses. Besides the phylloxera, increased facilities of disposing of wine and higher prices have doubtless led to less grape brandy being made, and to the business of distiller being practically separated from wine grower.

The effect of the present falling off in home production on the public revenue is somewhat curious. As a great part of the former large vintages was consumed at home, it paid no excise, either *droit de circulation* (duty when the wine was sold in bulk), or *droit de detail* (duty on sales by retail), or *droit d'entrée* (duty on entering a populous place), and, moreover, one of these duties (*droit de detail*) being levied *ad valorem*, the increased price has in some measure counterbalanced the smaller quantity. In 1876 the average price of the wine taxed on retail sale was 51 frs. per hectolitre (about 1s. 10d. per gallon), and in 1881 76 frs. (2s. 9d. per gallon), showing an increase of 50 per cent. There is besides a much larger customs revenue on foreign wine imported, as is shown by the next table, which also gives the excise duties on wine for the last ten years.

TABLE C.—*Statement showing the Amount of Excise and Customs Duties Levied on Wines in France in each of the Years from 1872 to 1880.*

Years.	Excise.	Customs.
	frs.	frs.
1872	139,195,000	1,342,000
'73.....	146,020,000	3,165,000
'74.....	146,507,000	3,367,000
'75.....	174,085,000	1,482,000
'76.....	189,285,000	2,219,000
'77.....	184,914,000	2,935,000
'78.....	184,656,000	5,711,000
'79.....	185,963,000	10,250,000
'80.....	177,629,000	25,257,000

Note.—Excise duties on wine amounted in 1881 to 139,721,000 frs., but as the rates were considerably reduced a comparison with the previous years is of little value.

Owing, then, to the rise in price to which I have referred, French wine has become an article of luxury, and it is to supply the demand both at home and abroad for a cheaper article that the various ingenious substitutes have been devised. These substitutes may be broadly divided into three classes: 1st, and far the most important, the manipulation and mixture (*coupage*) of cheap Spanish, Italian, and other wines with those of native growth. There is almost endless variety in the processes by which the different brands of claret are imitated. The various methods employed are to some extent known to the Government officers, who, I am informed, interfere when any material notoriously dangerous to health is being largely made use of. Thus fuchsine—a coal-tar dye, which was in demand for restoring the proper claret colour to the mixture of light and dark wines, appears to have been specially interdicted, elder berries and whortle berries being now more commonly substituted, and I think we should be very thankful for the change. The following Table D shows the imports and exports of wine from and to the principal countries in the last six or seven years, and the enormous increase from Spain and Italy is very apparent. While before 1876 only inconsiderable quantities were imported, since 1879 the imports have exceeded the exports, and the reduced duty of 2 frs. per hectolitre fixed by the new Franco-Spanish Treaty is likely to further increase this trade.

TABLE D.—*Return showing the Quantity of Wine Imported for Home Consumption in France from Various Countries, and the Quantity Exported (Domestic Produce) from France, in each of the Years from 1875 to 1881.*

IMPORTS.

Years.	Germany.	Belgium.	England.	Portugal.	Spain.	Austria.
	Hectol.	Hectol.	Hectol.	Hectol.	Hectol.	Hectol.
1875 ...	7,648	1,826	43,692	10,381	149,300	—*
'76	7,900	—	13,440	70,694	285,189	—*
'77	982	2,143	6,175	53,771	434,896	32,049
'78	10,266	1,572	4,805	16,158	1,347,645	9,352
'79	7,648	2,016	31,850	8,080	2,289,717	17,606
'80	12,304	3,321	13,265	33,886	5,112,387	289,656
'81	Not stated				5,722,296	Not stated

Years.	Italy.	Switzerland.	Turkey.	Algeria.	Other Countries.	Total.
	Hectol.	Hectol.	Hectol.	Hectol.	Hectol.	Hectol.
1875	50,005	4,594	—	—	24,384	291,830
'76	282,389	5,702	4,041	—	7,046	676,401
'77	158,082	5,117	5,678	—	8,471	707,364
'78	194,783	8,354	8,069	—	1,577	1,602,881
'79	540,113	13,214	21,329	5,131	1,078	2,938,112
'80	1,604,302	13,102	100,902	17,109	20,340	7,221,574
'81	1,551,299	Not stated				7,840,000

EXPORTS.

Years.	Germany.	Belgium.	England.	Netherlands.	Italy.	Switzerland.
	Hectol.	Hectol.	Hectol.	Hectol.	Hectol.	Hectol.
1875	638,811	328,276	319,610	150,039	45,311	698,898
'76	483,884	256,292	372,790	121,806	27,165	771,272
'77	391,978	234,714	406,761	80,005	25,567	553,041
'78	343,327	218,151	330,631	74,799	14,365	583,238
'79	446,113	300,499	353,261	132,498	12,056	512,295
'80	248,494	260,668	437,783	82,858	15,868	354,885
'81 ...	Not stated					

Years.	Turkey.	Algeria.	United States.	Argentine Republic.	Other Countries.	Total.
	Hectol.	Hectol.	Hectol.	Hectol.	Hectol.	Hectol.
1875	14,085	323,178	135,406	333,315	743,071	3,730,000
'76	44,180	347,751	113,765	174,653	617,262	3,330,910
'77	10,245	386,747	99,947	256,616	656,039	3,101,660
'78	20,830	285,825	82,848	223,909	617,057	2,794,980
'79	12,191	214,286	89,100	308,250	636,091	3,016,740
'80	9,081	180,641	84,824	213,460	599,018	2,487,580
'81	Not stated					2,590,000

* Included in other countries.

The second substitute is wine manufactured from dried grapes or currants and raisins. According to the excellent reports of the

Ministry of Finance published in the *Bulletin de Statistique*, the quantity of raisin wine amounted last year to 2,320,000 hectolitres (51 million gallons), and this estimate is confirmed by the statistics of the imports of currants and raisins for a series of years, shown in the following Table E. Their normal amount being about 10 million kilogrammes; and no considerable increase being known to be consumed in plum-puddings, an average annual surplus of 64 million kilogrammes, for the years 1880-81, would produce about 2 million hectolitres of wine, allowing for 30 kilogrammes of raisins to each hectolitre.*

TABLE E.—*Statement of the Quantity and Value of Currants and Raisins Imported into France for Home Consumption in each of the Years from 1871 to 1881.*

Years.	Quantity.	Value.
	Kilos.	frs.
1871.....	7,040,407	5,632,326
'72.....	9,226,464	9,226,464
'73.....	12,839,279	11,555,351
'74.....	10,576,241	8,460,993
'75.....	8,222,306	5,755,614
'76.....	10,894,409	5,417,204
'77.....	17,298,963	8,649,482
'78.....	29,658,192	14,829,096
'79.....	51,008,804	40,807,043
'80.....	78,289,962	62,631,970
'81.....	67,934,991	51,347,992

A large quantity of wine is also reported to be made from dried apples and pears imported from Portugal, &c.; but the French customs duty on these importations has recently been raised, with the consent of the Portuguese Government, who are well disposed to check the manufacture of imitations of their own wines.

As regards raisin wine, the recent rise in prices is said to be against any great development of this manufacture, and rather to leave the French wine of the future to be made from the third substitute, cane or beetroot sugar or glucose, mixed with water in the proportion of 16 kilogrammes to a hectolitre (1½ lbs. to the gallon) with a little tartaric acid, and then heated and poured over the grapes from which wine has already been made. The product is then combined with the foreign wine *coupage*, and coloured artificially. From a consumer's point of view, the chief objection to this "vin de sucre" is the quantity of unfermented sugar which it contains, but it appears to be a popular drink, for it is officially estimated that 2,130,000 hectolitres (47 million gallons) were made last year in France. The art of making fictitious wine of various kinds is now so much in exercise that several treatises on the subject have been published; one by Prévot Jenne, of Bordeaux, having special reference to sugar wine. Other books profess to

* The proportion of raisins to wine varies of course according to the alcoholic strength required, but in M. Debort's *Manual of Raisin Wine*, the allowance of 30 kilogrammes per hectolitre appears a fair average.

instruct only in the manufacture of real wine, and give receipts for the detection of artificial compounds. One of these by M. Robinet advises the use of gun cotton, where red wine is suspected to have been coloured by aniline dye, such as fuchsine, &c. When plunged into natural wine, gun cotton (pyroxyline) takes its colour, but loses it by washing, while, if there is any mineral dye in the wine, no amount of washing will get rid of the red colour. By carrying about a supply of gun cotton to test one's vin ordinaire at hotel or restaurant, it would be possible to avoid being poisoned, but one might come within the penal clauses of the Explosive Act.

A Bill has recently been introduced into the French Chambers for enabling wines to be fortified by added spirit up to 15° (26° Sikes) on paying only about 9*d.* a gallon on the spirit instead of about 6*s.* a gallon. Such an addition of spirit has long been allowed for wines for export, but the proposed exemption has in view the home market, and it is supposed both the wine growers and beetroot spirit makers would be benefited. It is doubtful, however, whether the exemption may not rather be made use of by the makers of "vin de sucre," and the professors of *coupage*.

An interesting report made by the United States Consul at Paris on this subject, concludes by advising all Americans to give up the unwholesome counterfeits of claret that are now produced in France, and drink instead the wines made in the United States, such as catawba and the many other brands that some of us have tasted in the States. There is at present no excise duty on the wines made in the United States, and we have no certain knowledge of their amount; but from a recent inquiry it is estimated that 23 million gallons were produced in 1880, of which two-thirds were made in California.

In conclusion, I would remark that it is most difficult, if not impossible, to forecast the future of the wine industry. Three classes of remedies against the phylloxera have been tried, with only partial success; namely, the substitution of American vines, flooding, and chemical treatment with sulphur, &c.; but the French agricultural department speak hopefully of their prospects of combating the disease, and the planting of vines in almost pure sand appears to have been adopted in many favourable localities with good results. In all probability the decrease in French wine production will lead to a great development of vine growing in other parts of the world; and it is to be hoped that before long our wine duties may be so modified from the present alcoholic rates which press so heavily on the cheap wines of hot countries, and we may then have access to the produce of Spain, Italy, and our own Australian and Cape colonies, without having them remanufactured at Bordeaux.

III.—*Decay of Population in France.*

THE following articles are taken from the *Times* of the 16th and 25th January, 1883:—

I.

"On the 7th of August last M. Goblet, then French Minister of the Interior, addressed to the President of the French Republic

a report on the returns of the census taken of the population of France in December, 1881. The state of things as regards the population of France which it declared was not new; it only confirmed, in fact, the unfavourable deductions drawn from every previous census for the last fifty years. Nevertheless, people hoped against hope that some change would take place, that the increasing sterility of the French nation as exhibited by past enumerations was only temporary; but the last census shows more clearly than ever that the population of France relatively to other Powers is declining year by year, and should it continue to show the same tendencies for another half century, France may still continue to be hailed as the *magna parens frugum*, but the grander words *magnu virum* will be no longer applicable.

"The report in question occupies itself chiefly with the returns of the census from an administrative point of view. However, it sets forth that after careful revision the total number of inhabitants in France in December, 1881, was 36,905,788, which shows an increase on the last census of 766,260. This augmentation was divided among fifty-three departments, whose combined increase was 945,643, while there was a decrease of inhabitants in thirty-four departments to the amount of 179,383, leaving an increase of the whole population of 766,260. Of this augmentation five-sevenths was owing to the large towns. If the towns of 30,000 inhabitants and upwards are taken together they will be found to have an increase of 561,869—a proof that the attraction of the great centres of population to the inhabitants of the country still continues. In fact, nearly one-sixth of the population of France, amounting to 5,948,242, is contained in forty-seven towns.

"These and the other figures of the report, when compared and considered with the official returns of previous years, show not only a general tendency to sterility in the population of France, but also that the same causes are at work creating a pretty constant rate of change in amount of inhabitants in the various departments of France.

"From 1831 to 1881—that is, during a period of fifty years—there have been official returns made of the numbers of the population every five years; there have therefore been eleven enumerations for this period, which, with the increase or decrease of each enumeration, are for the whole country as follows:—

Date of Enumeration.	Population.	Increase in Five Years.
1831.....	32,569,223	—
'36.....	33,540,910	971,637
'41.....	34,230,178	689,268
'46.....	35,400,486	1,170,308
'51.....	35,783,170	382,684
'56.....	36,039,364	256,194
'61*	37,386,313	1,346,949
'66.....	38,067,064	680,751
'72†	36,102,921	-1,964,123‡
'76.....	36,905,788	802,867
'81.....	37,672,048	766,260

* Annexation of Savoy.

† Loss of Alsace-Lorraine.

‡ Decrease.

“In regarding this table not only must the annexation of Savoy and the loss of Alsace and Lorraine be taken into consideration, but it must be remembered also that the increase of population since 1872 is due in no small measure to the immigration of the inhabitants of Alsace-Lorraine who have made option for their former country.

“The increase of the whole population of France in fifty years is therefore shown by the difference between the two returns of 1831 and 1881 to be 5,102,825. The slow rate of increase denoted by these figures is evident when we compare it with the increase of the population of the United Kingdom for the same fifty years, which has been, exclusive of emigration, 10,854,148. The numbers to be added for emigration cannot be less than 7 or 8 millions. It was estimated by the registrar-general that 2,453,481 persons had emigrated from Ireland alone during the years from 1851 to 1877 inclusive. And emigration in France being really insignificant, we have really had an increase of population within the borders of these islands during the last fifty years of some 18 millions as compared with 5 millions in France. If we take the five years ending 1880, the yearly growth of population in England was 340,118, against a yearly growth of 95,039 in France. Compared with Germany and some of the other States of Europe, France, in matter of growth of population, contrasts still more unfavourably. The growth of population in Germany for the five years ending 1880 was 2,466,800, giving a yearly increase at the rate of 493,300. The comparison with the United States of America is still more unfavourable.

“The yearly increases in the various countries are tabulated as follows:—France (average for last fifty years), 95,039; Great Britain (average for last five years), 340,118; Germany (average for last five years), 493,360; United States of America (average for last ten years), 1,155,446. These are the gross augmentations of each country in population, but when these figures are submitted to analysis, they reveal a still more unfavourable state of things for France. The increasing force of the population of the country is, however, of course, estimated properly by its relative, not by its absolute, increase—that is, by the proportion which its increase bears to its actual numbers. A small country like Denmark might have, and has, a smaller yearly increase than France, and yet be really increasing much faster. If the yearly increase of, say, 10,000 of inhabitants be properly calculated from the returns, we have the following result, which is of fatal significance for France:—Average increase for every 10,000 inhabitants: France, 26; Great Britain, 101; Germany, 115; United States, 260. These figures mean that for every 10,000 inhabitants to France there will exist but 10,026 at the end of one year, while in the United States the increase for the same period will be to 10,260.

“Another great country, Russia, according to the figures of the Russian Official Board of Statistics, adds to its European population at the average rate of 781,000 a year—a percentage which would double its population in fifty-eight years. But these figures have to be submitted to a still further analysis—they take

no account of the increase or decrease of population by accession or loss of territory, or of the facts of emigration and immigration. The most reliable measure of the increase of the population in a country is found in the amount of the excess of births over deaths.

"In France the excess of births over deaths was, for 1872, 172,936; for 1873, 101,776; for 1879, 96,647. The tendency of decrease is here most evident, and the comparison of France with the great countries of Europe gives us for excess of births over deaths the following figures:—Russia, 781,000; Germany, 592,098; Great Britain, 436,760; France, 96,647. These figures have, however, to be corrected by the statistics of emigration, which give us for the following countries:—

Countries.	Emigrants.	Immigrants.	Difference.
England (1880)	228,473	68,316	160,157
Germany (1879)	33,327	5,323	28,004

"In France the emigration statistics are very defective, but it is believed that the number of naturalised foreigners in each year is about equal to the number of emigrants.

"Deducting the number of emigrants, therefore, to each country, we have these final results to denote the yearly increase of population in each country:—Russia, 781,000; Germany, 564,094; Great Britain, 276,623; France, 96,647. To account for the small excess of births over deaths in France, three causes only can be alleged—either an excessive death-rate, or the small proportion of marriages to the population, or the sterility of the marriages themselves. Statistics, however, show us that the two first causes do not really exist in France. The death-rate in France is lower than in Germany—it having been calculated to be but 1 in 450, while the death-rate in Germany is 1 in 400; that for Great Britain being 1 in 500.

"Similarly the official returns prove that the proportion of marriages in France relatively to other countries is not a low one; consequently the diminution of the number of children born of the marriages in France must be assigned as the real cause of the increasing infecundity of the French nation. That the small growth of population in France is really owing to this cause is, indeed, no new discovery; only recent circumstances have made more clear the consequences which must result therefrom to the future of France.

"Tables have been made of the numbers of the births, deaths, and marriages in each year for every thousand of the French people since 1801, and these tables show that while the death-rate has decreased and the marriage-rate remained stationary, yet that the birth-rate has gradually decreased since 1801. Taking, too, the gross amounts of births year by year in France since 1826, we get these results:—Births in France—1826, 992,260; 1866, 1,006,258; 1870, 940,315; 1875, 950,975; 1879, 936,529. Thus,

notwithstanding the increase of population in France amounting to six or seven millions since 1826, the number of yearly births is less now than it was then. If the birth-rate be taken for the different departments of France, it is found that it has increased in four departments only—Aveyron, Lozère, Loire Inférieure, and Vienne—since 1801.

“The average birth-rate per annum in France for the period between 1872 and 1880 has been calculated to be 1 birth for 37 inhabitants, which is by far the lowest birth-rate in Europe. For the different countries the birth-rate is as follows:—Russia, 1 birth for 20 inhabitants; Germany, 1 birth for 25; Austria-Hungary, 1 birth for 26; England, 1 birth for 27; Italy, 1 birth for 27; Spain, 1 birth for 28; France, 1 birth for 37. If the yearly number of births for any thousand inhabitants be calculated, we have precisely the same result. We have, in France, 26 births per 1,000; Belgium, 32; England, 35; Austria, 38; Prussia, 38; and Russia, 50. Naturally it follows from this that the average number of children to each marriage is inferior to what it is in other countries, supposing all the children born in each year to be legitimate. There are five births for every marriage in England and Germany, and only three for France. Ordinary observation, without the aid of statistics, would have led us to expect such a result. We all know that French people are in the habit of speaking of a family of five children—the average number in England and Germany—as a large family, while families of from eight to ten children, common enough in former times, are now almost unheard of except among the poorer classes in the poor departments of France.

“Before fifty years are over, France will, at her present slow rate of increase of population, have sunk, if not to the level of a second-rate, at least to the bottom of the list of the Great Powers. If we suppose that the population of the United States and of the various countries of Europe are decimated by no wars or exceptional maladies, and still preserve their present frontiers and go on increasing at the present rate of increase, their populations will by the year 1932—a time which our children will see—be as follows:—United States, 190 millions; Russia, 158 millions; Germany, 83 millions; Great Britain, 63 millions; Austria-Hungary, 44 millions; and Italy, 44 millions. So that France, which a century ago was really *La Grande Nation*, having still the largest population in Europe, will be but the sixth in rank in point of numbers.

“Will France, with her diminished numerical importance as a Great Power, make up for her deficient numbers by that public spirit and genius for enterprise which has raised so many small powers to a level in point of influence with the greatest? This, also, if we consider the causes which led to the increasing sterility of the country, may also be doubted. In fact there are not wanting now Frenchmen who look on this decreasing population as but one among many signs of national degeneracy, and are ready to exclaim hopelessly, ‘*Finis Gallie!*’”

II.

“The statistics of the different departments of France viewed

by themselves and contrasted with each other strengthen the discouraging conclusions to be drawn from the consideration of the returns for the whole of France. Those departments in which a decrease set in fifty years ago continue to have a decrease still. During the fifty years between 1826 and 1876 there has been a constant excess of deaths over births in the following departments and to the following amounts: Eure, 56,899; Calvados, 49,042; Lot-et-Garonne, 35,079; Var, 26,407; Gers, 10,181; Orne, 7,197; Tarn-et-Garonne, 6,266. These departments in which the population has decreased may, with the exception of the outlying department of the Var, be divided into the Normandy group and the Languedoc group. The Normandy group comprises Eure, Orne, Calvados, and La Manche, four of the richest and most fertile departments of France. Of the five departments of which Normandy consists, only one department, that of the Seine Inférieure, has increased in population, and it has done so very considerably, but that it has done so is owing to the growth within it of the large towns of Havre and Rouen, the growth of which large towns, however, has taken place at the expense of the neighbouring agricultural departments, to the depopulation of which they have both contributed. For the population of the four above-named agricultural departments, which in 1826 was 1,968,206, was but 1,698,737 in 1881.

“The decrease of the birth-rate is not, however, confined to these four departments of Normandy, but the neighbouring departments of Sarthe, Eure, Loire, and Maine-et-Loire have also become infected with the same sterility.

“The group of departments in Languedoc have probably the contiguity of the large towns of Toulouse, Marseilles, and Lyons to thank for their decrease of population.

“This absorption of the population of the country into large towns is a phenomenon of the times remarkable in other countries as well as France, although France affords the most striking instance of the tendency, and this constant set of the country populations towards the towns in France not only denudes the rural districts of their inhabitants, but the emigrants in changing a country life for a town life become themselves less reproductive, since the birth-rate in large towns is normally less than that of the country, and we know that large towns like London and Paris have their populations maintained and increased by the continued flow of immigrants from the country, so much so that in these capitals it is rare to meet in society with a man born in the metropolis itself, and families which take up their residence in a metropolis usually become extinct after two or three generations.

“There are still, however, fortunately for France, some departments which show an increase of population, and so prevent an absolute decrease of the whole population of the country, and it is curious that the departments in which the population is increasing are among the richest as well as among the poorest in France—the departments of the provinces of Artois and French Flanders, the Nord, and the Pas de Calais, and the departments of Brittany.

“The rich and populous department of the Nord shows an

excess of births over deaths of 450,905 for the fifty years between 1826, and an increase of population of 83,674 in 1881 over that of 1876; the neighbouring department of the Pas de Calais also shows an increase of population of 25,882 for 1881, as compared with 1876. It is probable that the vicinity of Belgium has had some influence on the population of Artois and French Flanders. If the other departments of France had increased in population like the Nord, the population of France would have doubled itself in fifty years.

“The five departments of the province of Brittany show an excess of births over deaths of 634,893 for the fifty years ending 1876. The other departments which show the largest excess of births over deaths are the Allier, the Loire, Aveyron, Corrèze, and Haute Vienne, and the general conclusion is that for the whole of France the birth-rate is diminishing. It remains, indeed, elevated in Flanders, Artois, and Brittany, and the middle of France, but this elevation is counteracted by the decrease in the birth-rate of the other departments.

“The explanation of this strange increase of sterility in France is that the doctrine of Malthus is put into practice there in a way and to an extent never contemplated by the author. Over the greater part of France the standard of comfort and well-being has been increasing ever since the termination of the great war in 1815. The country had been so drained and impoverished by the great wars of Napoleon and by a century and a half of bad government, that the general misery of the population was indescribable, and the poverty even of the landed proprietors and middle classes was very great. The roads were bad and infested with brigands. The produce of the country found no markets for want of carriage, and to kill a sheep in a country village was a rare event. Those were the days of extreme thrift at home and abroad. The habits of thrift have not been forgotten, although they have changed in kind, while the change of the condition of the country from one of poverty to extreme wealth is almost unparalleled in history. The creation of a railway system all over the country has raised the value of land enormously, and the produce of any part of the soil finds ever ready markets in the great centres of population and industry. The soil of France, above all, is one of the finest in the world, and its vineyards are really greater and more unfailing sources of wealth than mines of gold and silver, since their wealth, if they escape the ravages of the phylloxera, is virtually inexhaustible.

“For many years, therefore, comfort and well-being, and even luxury, have made their way into the households of all classes in France. The standard of living has risen enormously. The habits of saving and thrift have not been neglected. In the art of managing and regularizing their lives French people are unrivalled, and the object of every family is to live and to save at the same time, so as to be able to leave their sons and daughters in as good a position as themselves, at all events, and in a better, if possible. How inimical these aims in life are to anything like adventure and enterprise is only too apparent in the lives of all

ordinary Frenchmen of the present day. Two professions—the Army and the Church—suffer immensely from this state of things, for, as a rule, no young Frenchman who could see his way to anything better would choose either career, and a military career especially is regarded with increasing dislike.

“Among people with such habits and such views of life, the risk and expenditure attendant upon a large family are naturally regarded with horror. ‘Since two or three children give us sufficient enjoyment of the pleasures of paternity, why,’ the greater number of Frenchmen argue, ‘should we have more? With two or three children we can live comfortably and save sufficient to leave our children as well off as ourselves; a greater number would entail curtailments of enjoyment both for ourselves and our children.’

“The equal distribution of property on intestacy, and the incapacity, and, indeed, general unwillingness, of the parents to make any much greater provision for one child than another, also operate in the same direction. Since all children share alike, if the children are to live the same lives as their parents and have the same advantages in starting in a profession or in business, the family must needs be a small one. No French parents could entertain the notion of their children and their children’s children having to contend with greater poverty than they have themselves been accustomed to. Why should such a fortune have to be divided among seven or eight children when, according to the family habits, it is comfortably sufficient only for two or three?

“It is clear, too, that if, as a general rule, the family is limited to three children, the law of succession in France and the custom of equal division of property does not, when combined with French habits of thrift, operate so as to give the children smaller portions of property than their parents. If there are two families—A and B—each with three children and with properties of equal or of nearly equal value, and one of the children of the family A marries one of the children of the family B, the married children will, on the principle of equal division, have property equal to two-thirds of the property of either family, A or B. But with the French habits of thrift and saving the probability is that they will be better off even than their parents, for the parents of the families A and B have but to economise to the extent of one-third of either of their properties in order to leave each child as well off as they are themselves; and since, as a rule, every Frenchman lives largely within his income, this is generally accomplished.

“Generally throughout Europe it is found that the families of people well off, including the families of professional people and tradespeople, are less numerous than the families of the artisan and the agricultural labourer, and this is especially the case in France. The fatal conclusion resulting from the population returns is this, that the families of the artisan and the agricultural labourer are themselves on the decrease, while the absorption of the rural populations in the towns tends still more to depopulate the country.

“Since 1801 all the chief towns of France have increased

enormously, and if the rest of the population had increased in the same way France would now possess 75 millions of inhabitants. The populations of the chief towns were relatively in 1801 and 1881 as follows:—

	1801.	1881.
Paris	546,856	2,269,023
Lyons	109,500	376,613
Marseilles	111,130	318,868
Bordeaux	90,992	221,305
Lille.....	54,756	178,144
Toulouse	50,171	140,289
St. Etienne.....	16,259	123,813
Havre	16,000	105,867

Had it not been, indeed, for the augmentation of the populations of Paris, Lyons, and Marseilles, all the population of France would really have diminished during the last five years. This is a point of especial importance in considering the growth of population in France, for the increase of the populations of the towns means not only a diminution of the inhabitants of the country, but also a diminishing birth-rate among the rural immigrants into the towns, since the inhabitants of towns have for the most part everywhere a lower birth-rate than the people of the country.

“The inhabitants of the country, the most prolific part of the population, are continually floating towards the towns, and there become unprolific. The whole population of France is, it is true, increasing slowly, but the rural part of the population is positively diminishing, and the diminution becomes more and more marked every year. In fact, if the town population continued to increase as at present, and the rural population to decrease, the country districts of France would become quite depopulated. As it is, a large share of the rural work at harvest times, and nearly all the rough work of excavation on new docks and railways, are done by Belgian, Italian, and Spanish immigrants.

“Various other reasons have been put forward to explain this increasing sterility of the French nation, but, after all have been examined, no valid reason can be sustained except that before mentioned—the growing indisposition of the people to have large families; and with the increase of wealth in the country it is probable that this indisposition will increase instead of diminish.

“Some have asserted that the physical vigour of the Frenchman has decreased, but there is no ground whatever for such an assertion. Density of population has been put forward as another reason; but France is really sparsely populated compared with Belgium, England, Italy, and other countries. If France were as densely populated as England and Wales she would have 72 million inhabitants, while in the most densely inhabited districts of France—like the Nord and the Pas de Calais—the population really does increase.

“Wars have no doubt contributed to keep down the population.

It has been calculated that the wars of the Second Empire cost the country 1,267,276 inhabitants. The excess of deaths over births during the Franco-Prussian War amounted to 547,988, and the whole excess of deaths over births was for the five years of war of the Second Empire 614,340, to which must be added to make up the loss the number of births lost to the country by the war, and the loss of 1,634,662 French men and women by the cession of Alsace and Lorraine.

“Neither, however, wars nor any other cause would account for the increasing depopulation of the country districts of France, and the increasing sterility of the whole nation can have no other causes assigned to it but those of habit and calculation.

“Various remedies have been proposed to remedy an evil which must infallibly, if it goes on, in course of time, reduce the relative power of the French nation to a degree of inferiority such as could never be produced by pestilence or disastrous warfare, but none of these seem to hold out much hope. Some of them, such as a tax on bachelors, a tax on the fathers of small families, and the immunity of the fathers of large ones from taxation, are calculated to raise a smile. It has even been proposed as a desperate remedy to restore the custom of primogeniture.

“The most promising antidote would seem to be a public encouragement of emigration and a spirit of foreign enterprise. If Frenchmen could be induced to follow the example of the peasants of North Italy and of the Engadine, who expatriate themselves commonly for a series of years, and go abroad and make fortunes with a view of returning and settling down in comfort in their own country, some hope might be entertained. But the Frenchman, and, above all, the Frenchwoman, have become so attached to the soil of *la belle France*, with its attractions of art and nature, that we regard such a change of national feeling as must ensue to bring about a system even of temporary emigration as beyond the range of probabilities. Even now it is rarely the case that a Frenchwoman will accompany her husband when he goes abroad with a good appointment and permanent employ; she prefers to let him go into exile by himself.”

IV.—*Australasian Statistics.*

THE following correspondence on Australasian statistics has been taken from the *Times* :—

(*Times* of 20th December, 1882.)

“Sir,—Permit me to call attention to certain figures in the paper read by Sir Francis Dillon Bell at a recent meeting of the Colonial Institute, and briefly noticed in the *Times*. I have not a word to say against the general prosperity of the Australian colonies, which was the theme of the paper; but along with much that was excellent the paper also contained a great deal of glorification of

the Australian colonies, based upon inadequate data and statistics of so remarkable a description, that they should not pass without notice. They seem to have passed muster at the meeting without much criticism.

“The first of these statements relates to the relative health of people in the United Kingdom and New Zealand. Sir F. Bell states:—

“‘Nor, happily for us, have we to dread the evils which in Europe retard the growth of every nation. Not only are we free from the load of pauperism by which they are oppressed; the ratio of sickness is so low that the vitality of the people is at a very high point. In England the adults between the ages of 20 and 60 undergo, in that period of forty years, an average of eleven days’ sickness in each year; in Australia they have only to undergo seven days, and in New Zealand hardly more than five. England loses 3 per cent. of the productive power of her people by pauperism, and 4 per cent. by sickness, or in all 7 per cent.; the total loss in Australasia is only $2\frac{1}{2}$ per cent., which is the lowest of any country in the world. The vital statistics of Australasia, in fact, are far better than in any other country whatever, and the highest natural increase is that of New Zealand—namely, 30 per 1,000, or 3 per cent. on the population, which is the highest ratio in the world. Thus, in what creates and preserves the strength of a people, we stand pre-eminent.’

“Now, without disputing that New Zealand may be a more healthy place than England, as to which there are probably no data for forming any judgment, what I should like to ask is—What is the author’s authority for the assertion that adults in England undergo between 20 and 60 an average of eleven days’ sickness in each year? There are no sickness statistics in England applicable to the whole adult population, whatever there may be in New Zealand. The statement must accordingly be an inference from incomplete data of some sort; and what are these data? The figures certainly ought not to have been put forward as of the same species with statistics of railway traffic, population, and others in the paper respecting which there are presumably official data.

“Moreover, it would obviously be unfair to compare the adult sickness throughout England generally with the adult sickness throughout New Zealand generally. England is mostly manufacturing; New Zealand agricultural; and there are reasons why a manufacturing and town population should not be so healthy as an agricultural population. The difference of conditions in all such comparisons ought to be taken into account. Is the rural population of New Zealand healthier than the rural population of England? Is there—or can there be—any good evidence at all on the subject?

“Then as to the statement that in New Zealand the ratio of the natural increase of the population is the highest in the world, being 3 per cent., so that ‘in what creates and preserves the strength of a people we stand pre-eminent,’ I venture to affirm that the statement is absolutely unfounded. I presume from the

connection with other parts of the paper that the 3 per cent. increase referred to is an increase of 3 per cent. per annum; but in a normal population such a natural increase is without example, if not physically impossible. Sir F. Bell can only make the statement because he disregards the peculiarity that New Zealand, like other new countries, has got a disproportionate share of women at child-bearing ages. The higher ratio in New Zealand does not mean any greater vitality in the people, but only that they have lately received many immigrants. The statement is based apparently on a comparison of the general birth and death-rates only—the birth-rate in New Zealand being stated as 41 per 1,000 annually, and the death-rate 11 per 1,000 annually. But these figures do not show the ‘natural increase.’ They only show that part of the actual increase due to the excess of births over deaths, and excluding immigration. The ‘natural increase’ is a different thing. To arrive at it in a community receiving immigrants it is absolutely necessary to eliminate the immigrants on the one side and the births and deaths among these immigrants on the other side, and then compare the birth and death-rates of the older population only, just as in an old country sending out emigrants the reverse operation is necessary, the ‘natural increase’ in that case being more than the actual increase. The truth is, however, that in New Zealand, from its great newness, there can be no general birth-rates or death-rates of any value. The difference between the birth and death-rates there does not show a ‘natural increase’ which can be compared with the natural increase elsewhere, but an increase which is altogether unnatural and artificial, arising from the constitution of an artificial population without the normal intermixture of old and middle-aged.

“In the same connection I see it stated in a table that the birth-rate in the United States is 40 per 1,000 per annum, the death-rate 22 per 1,000, and the ‘natural increase,’ so-called, 18 per 1,000. But what is the authority? There are no general statistics of births and deaths in the United States, which has also a large immigration. The figures can be nothing better than guesses. How is the guess made?

“In another part of the paper there are figures just as wonderful. Thus we are told that the ‘commerce’ of Australia is 100 million pounds, or 34*l.* per inhabitant; England 571 million pounds, or 16*l.* per inhabitant; France 332 million pounds, or 9*l.* per inhabitant; the United States 309 million pounds, or 6*l.* per inhabitant; and so on—all to the greater glory of Australia. But what is meant by ‘commerce?’ Is it ‘foreign’ commerce or ‘home’ commerce, or what? And if it is ‘foreign’ commerce, does it include shipping, or commissions and brokerage, or the intercolonial commerce; or what does it include? I am the more puzzled because on the assumption that a part of foreign commerce might be meant—viz., the imports and exports, I have tried to see if the English figures were right, and I cannot make them out. The imports and exports of the United Kingdom are not 571 million pounds, but nearly 700 million pounds, without including shipping, trans-shipment, or bullion. My objection, however, is to ‘com-

merce' being spoken of in this way without any definition. Yet on this statement is based the assertion that 'one Australasian does as much trade in the year as two Englishmen, four Frenchmen, five Germans, six Americans, or eight Italians.'

"A body like the Colonial Institute, I submit, owes some explanation to the public for allowing such statistics to go forth with its *imprimatur*. It is true the Institute, like other societies, disclaims any responsibility for the utterances of the speakers at its meetings. Still it has or ought to have some control, which should be exercised so as to prevent the manifest nonsense and extravagance which characterise the statements I have been commenting on. The colonies have quite enough that is genuine to say for themselves, without their merits being travestied in this way.

X. Y. Z."

(*Times* of 28th December, 1882.)

"Sir,—I have been in the west of England, and only got home late last night. Although I do not like entering the lists with anonymous writers, I answer the statements of your correspondent 'X. Y. Z.' out of respect to what the *Times* said in its money article.

"Three statements of mine, and three only, are attacked by him. I will take each as briefly as I can.

"1. As to sickness statistics. Your correspondent has evidently never heard of Finlaison, Ratcliffe, Neison, or Heym. If it would not occupy too much of your space, I would send you tables for England for 1845 and 1870, for Scotland and for Germany. But Dr. Farr (I hope 'X. Y. Z.' knows who Dr. Farr is) gave us nearly thirty years ago a scientific method about sickness statistics—namely, that 'the number of persons constantly sick is equal to twice the annual mortality;' and Dr. Kellogg, in a United States report in 1881, reminded his readers that 'the statistics of friendly societies in England showed that for every person who dies two are sick throughout the year.' Applying this formula to 1880, the following table may be accepted:—

	Deaths.	Number Sick.	Ratio to Population.
England	528,056	1,056,112	4'10
Scotland	75,795	151,590	4'09
Ireland	102,955	205,910	3'88
Australia	32,026	64,052	2'80
New Zealand	5,437	10,874	2'20

Thus, as I said, England has a loss of 4 per cent. and New Zealand 2 per cent. of working power by illness, which is equal to fourteen days of labour of the whole population per annum in England, against seven in New Zealand. Of course, I never said that such a difference was not mainly due to immigration.

"2. As to natural increase. The latest returns of the Colonial Abstract (Board of Trade, April, 1882) are for 1880, and show as follows: Rate per 1,000 inhabitants, New Zealand—births, 41; deaths, 11; increase, 30.

“‘X. Y. Z.’ objects to my calling this ‘natural increase;’ then let him give us a better definition than natural ‘increase’ or ‘increment,’ which is the more official term. But he says my statement was ‘absolutely without foundation;’ and that, in order ‘to arrive at natural increase in a community receiving immigrants, it is absolutely necessary to eliminate the immigrants on one side and the births and deaths among those immigrants on the other side, and then compare the birth and death-rates of the older population only, *just as in an old country sending out emigrants the reverse operation is necessary.*’ I quote the passage for the sake of the last words, which I have put in italics. Who ever heard of this ‘reverse operation?’ I invite ‘X. Y. Z.’ to name the statistician who performs it. Such a method would not only make the vitality of a colonising country like England impossible to be computed, but would prohibit any vital statistics being ever compiled for a colony at all. As to the vital statistics of the United States, there are plenty of the most reliable kind. The United States Bureau gives the net immigration of 1871-80 at 2,246,561; and as the total increase of population in the decade was 11,880,092 (Census 1880), the balance of 9,633,531 is the ‘natural increase,’ representing, as I said, 22 per cent. for that decade on a medium population of 44 millions. As the medium population was in reality nearly 44½ millions, I ought to have said more exactly 21½ per cent. for the decade. If ‘X. Y. Z.’ will not call these 9 millions ‘natural increase,’ by what term would he like to express his idea of where they came from?

“Surely you must take a country as it actually is. If it is a new country receiving immigrants, then so long as it receives them its birth and death-rate will be better than that of the old country from which they come. Your correspondent accuses me of ‘disregarding the fact that new countries have a disproportionate share of women at child-bearing ages.’ On the contrary, that is exactly what I take into account. If you bring in plenty of young women it stands to reason there will be plenty of babies. I call these ‘natural increase:’ ‘X. Y. Z.’ says they are ‘unnatural’ and ‘artificial.’ I assure him they are nothing of the sort. And unless you say that young women are not to be brought in at all, you cannot escape the admission that the countries which bring them in most are ‘pre-eminent in what creates and preserves the strength of a people.’

“3. As to commerce. I am afraid ‘X. Y. Z.’ has never heard of Mr. Giffen. Let me suggest that it would do him good to read Mr. Giffen’s paper read before the Statistical Society (21st March, 1882) ‘On the Proper Use of Import and Export Statistics,’ where he pulverises an unhappy writer who had ‘made a great mess of his imports,’ and, like ‘X. Y. Z.,’ could not ‘make them out.’ Mr. Giffen lays down the true principle thus:—‘Our gross imports last year were 410 millions, but deducting 65 millions for re-exports, and 60 millions for raw material previously imported and included in manufactures exported, together 125 millions, we arrive at 285 millions only as the net import.’ It was in accordance with this principle that I deducted goods in transit,

as is now always done; and I said in the paper that I had done so. It is only by counting twice, like soldiers in a circus, that 'X. Y. Z.' can get his own figures out. I pursued the same broad rule in the table for the commerce of other countries, excluding goods in transit as essentially belonging to the trade of another country.

"These are the only three points on which your correspondent impugns my paper. He does not err on the side of superfluous politeness when he accuses me of talking 'manifest nonsense,' and of having 'travestied' the colonies. But that is nothing. The few opinions I cared to give in the paper are, of course, open to challenge, but I do not admit the statistical statements are. I acknowledged then, and I repeat here, the invaluable assistance in these which I have received from Mr. Mulhall; I do not pretend to be an authority myself; but I confess I should like 'X. Y. Z.' to let us know the name we are to accept as convicting us of 'nonsense.' Yet I ought to be well pleased. If his criticisms have made anything I said appear 'rather wild' to the *Times*, I am more than repaid for this by the generous judgment which accepts as correct 'the general result of my argument as to Australasia being abundantly solvent.' When the *Times* says that, it says the one thing I had set myself to show.

"22nd December.

I am, &c., F. D. BELL."

(*Times of 29th December, 1882.*)

"Sir,—In his letter to you in the *Times* of to-day, Sir F. Bell quotes my paper on the use of import and export statistics, read before the Statistical Society last March, as justifying his handling of certain figures of imports and exports in a paper of his read before the Colonial Institute. He quotes a passage of mine in which I suggest that by making a deduction from our nominal imports of 410 millions in 1880, first for the re-exports, and next for raw material previously imported and included in manufactures exported, together 125 millions, 'we arrive at 285 millions only as the net import:' and he goes on to add—'It was in accordance with this principle that I deducted goods in transit, as is now always done.'

"Would you allow me to point out that the object for which import and export figures are used in the paper which Sir F. Bell read before the Colonial Institute was not one for which I recommended the correction of those figures in the way that Sir F. Bell states that he has corrected them? His object apparently is to compare the amount of trade transacted: but the correction which I suggested was only when the figures were used for certain purposes. What I said was:—

"A fifth cause of difficulty in appreciating the figures of imports and exports, especially for comparative purposes, arises from the different character intrinsically of the foreign trade of different countries. Admitting that quantities and values are stated in precisely the same way, the figures do not mean the same thing to each country. There are at least two important differences possible, which I shall notice, viz., the differing degrees in which the trade may be one of transit only, and the different amounts

of the carrying trade of different countries, as to which there is no precise record of values, yet the outlay on which, by a shipping country, may be as much an "export" as the export of grain from a grain-growing country like the United States, which happens to be exactly recorded.'

"And again, with special reference to a correction with a view to leave out the transit trade, I stated:—'When the real magnitude of the export trade of different countries is compared so as to show their dependence on foreign countries for markets, the point of view here referred to is not to be lost sight of.' Again—'A similar rectification is also necessary as regards the imports, in any comparison at least of what is imported for final consumption, with the exports of native produce.'

"It will thus be seen that my suggestion had reference exclusively to the purpose for which import and export figures were to be used. I should never have dreamed of suggesting that it should be applied in all cases and for all purposes. In the present case, as far as I can judge, for the object he had in view, Sir F. Bell's proper course would have been to have retained the full nominal figures of imports and exports as published, and added to them so as to allow for our carrying trade, which was equally a suggested correction of mine for certain purposes. In any case I desire to guard against being thought to have laid down any absolute principle by which import and export figures should always be corrected.

"Sir F. Bell speaks of me as having in the same paper 'pulverised' a writer for making a mess of imports and exports. It seems to me, from his own paper, that Sir F. Bell has committed the very blunder which I attacked. He speaks of 'trade' in the same general way as a writer whom I referred to spoke of 'commerce,' so that, *mutatis mutandis*, the following language which I used in my paper is applicable to Sir F. Bell:—'He speaks of the "commerce" of the world having increased 36 per cent. in the ten years, and English commerce so much less, the actual fact being, of course, that there is no figure in existence which can be spoken of as representing the commerce of the world, while the writer probably meant the foreign commerce, and yet excluded from his comparison one of the most important parts of English foreign commerce, viz., the shipping.' I am, &c.,

"28th December.

R. GIFFEN."

(*Times* of 30th December, 1882.)

"Sir,—Sir F. Dillon Bell, in his reply in the *Times* of to-day to my former letter on the subject of certain figures in his recent paper on New Zealand, substantially admits the justice of my criticism.

"1. As to sickness statistics. What I said was that 'there are no sickness statistics in England applicable to the whole adult population, whatever there may be in New Zealand.' Consequently, I argued, the statement that in England every adult has, on the average, eleven days' sickness in each year between the ages of 20 and 60, must be an inference from incomplete data of some

sensible one, while in none, apparently, is the average annual sickness more than ten and a half days, instead of the eleven or fourteen days referred to by Sir F. Bell.

“Further let me point out that all these statistics really relate to weeks of ‘sickness-claim,’ which may not be quite the same thing as sickness, respecting which we should still remain with incomplete knowledge even if these statistics of sickness-claims were more complete than they are. Mr. Neison remarks:—‘It will be observed that in each group of ages the weeks of sickness by the results of the Foresters’ data are slightly in excess of the Odd-fellows’ rates. The difference may arise either from the somewhat different distribution of the lives in the two data, or else from the circumstance that in one order (the Foresters’) there are not so many as in the other of the class of members who, notwithstanding any disability for work which they may experience in consequence of illness, seldom declare upon the funds in respect of it, which of necessity would reduce somewhat the apparent sickness of the branch.’ Further—‘The much lower rates of sickness from age 40 upwards represented in Mr. Finlaison’s tabulation of the Government returns for 1846-50 is due to the circumstance that, for the reasons given in his report, he thought proper to discard from the inquiry all cases of chronic ailment.’ Yet it is to such statistics, which relate only to what are called the sickness-claims of a portion of the population, we are referred for our knowledge of adult sickness—a different thing altogether—throughout the whole of England.

“There is another criticism to be made. While there are sickness statistics of a kind in England, though not relating to the whole adult population, is there anything as regards New Zealand except the formula deducing the sickness from the death-rate, which, as we have seen, does not give quite the same result as these statistics? And if so, how does Sir F. Bell know that a formula which Dr. Farr arrived at for England as the best possible thirty years ago, though he continued to call for sickness statistics, is applicable not only to England, but to New Zealand at the present time? How can we know that deaths in New Zealand are not accompanied by more or less sickness than they are in England? All this surely justifies me in making the suggestion of my last letter, viz., that the data as to sickness in England and New Zealand were incomplete; and that Sir F. Bell, in stating certain figures, should have told what his data were. The criticism, of course, remains that any real comparison between New Zealand and England in respect of sickness would be most difficult on account of the different conditions of the populations; but, as a matter of fact, we have no sufficient data to compare.

“2. As to the ratio of the natural increase of population, Sir F. Bell practically admits that he has disregarded the peculiarity that New Zealand, like other new countries, had got a disproportionate share of women at child-bearing ages. He maintains that he is entitled to treat the excess of births over deaths as the natural increase, and as a proof, where it is highest, even in a new country, of the superior vitality of a people; but he does not deny

that he identifies this excess of births over deaths with the natural increase. This is quite enough, I submit, to justify my criticism. It must be clear to every one that an unusually large excess of births over deaths, which is really due to accidental and temporary circumstances, has nothing whatever to do with the vitality of a race, with 'what creates and preserves the strength of a people.' Sir F. Bell would have been quite entitled to use the figures as proving the actual increase of the people in New Zealand; but when he uses them in connection with sickness statistics as a proof of superior vitality, he is using them for a purpose for which they cannot be used without a great deal of correction. After the pains which have been taken by statisticians, from Malthus downwards, to distinguish between the natural rate of increase of population and the actual increase, as modified both by emigration and immigration, it is certainly a little surprising to find the excess of births over deaths in a new country treated as the natural increase which can be compared with the natural increase of older countries. I can only refer Sir F. Bell to Malthus and other writers on population, if he wishes to have any idea of the difficulty of population statistics, and the numerous corrections that are necessary to arrive at natural, as distinguished from artificial or factitious rates of increase. There are even more qualifications necessary than I stated in my first letter.

"Then as to the United States' figures, what I asked was the authority for the statement that the death-rate in the United States is 22 per 1,000 and the birth-rate 40 per 1,000, making the 'natural' increase 18 per 1,000. In reply, Sir F. Bell tells us that there are plenty of vital statistics in the United States of the most reliable kind, and he then proceeds to deduce from a comparison of the census and immigration returns the conclusion that in the decade from 1870 to 1880 the natural increase was 22 per cent., or more exactly, as he now says, $21\frac{1}{2}$ per cent. But this is not an answer to my question, which related to the birth and death-rates, and not merely to the rate of the excess of births over deaths. Again I ask what is the authority for the statement that the death-rate in the United States is 22 per 1,000, or any other rate; or that the birth-rate is 40 per 1,000, or any other rate? I affirm that there are no statistics in existence from which such rates can be directly deduced. Will Sir F. Bell tell us how he obtains them?

"Curiously enough, however, what Sir F. Bell tells us now as to the 'natural increase' in the United States, the excess of births over deaths, does not agree with his former statement. What he said was, that the excess was 18 per 1,000 per annum. Now he tells us that it was 22 per cent. in the decade 1870-80; but this is not the same thing. A little arithmetic would convince him, I think, that 18 per 1,000 per annum would not give $21\frac{1}{2}$ or 22 per cent. in the decade, but only $19\frac{1}{2}$ per cent. or thereabouts. I must press the question more strongly, therefore, as to the authority for the three rates, 22, 40, and 18 per 1,000. At the same time, with regard to any deductions from the United States' census figures of 1870 and 1880, it is interesting to bear in mind that it is now officially admitted by the United States' census

authorities themselves that in the census of 1870 the population was erroneously stated—there was one important error. Does Sir F. Bell allow for this in computing the ‘natural’ increase; and how?

“3. As to commerce. Sir F. Bell does not reply to me at all. What I asked, regarding his comparison of Australian commerce with that of other nations, was—what was meant by commerce? ‘Is it,’ I said, “‘foreign” commerce, or “home” commerce, or what? And if it is “foreign” commerce, does it include shipping or commissions and brokerage, or the intercolonial commerce; or what does it include?’ To these questions I have again to ask for a reply.

“I gather from Sir F. Bell’s explanation of a minor puzzlement of mine in my endeavour to find out a meaning for his words, and ascertain what the figures were really intended to stand for, that he means that part of foreign commerce called ‘imports and exports.’ But is this so or not? In such matters the greatest explicitness of definition is manifestly necessary. If we are to take ‘imports and exports’ as equivalent for ‘commerce,’ we are certainly led to most extraordinary conclusions, such as that of Sir F. Bell, which I asked him to explain, viz., that ‘one Australasian does as much trade in the year as two Englishmen, four Frenchmen, five Germans, *six* Americans, or eight Italians.’ I have italicised six Americans. Does Sir F. Bell believe that one Australasian does as much trade as six Americans? and if he only meant that they imported and exported six times as much why did he not say so? Why talk of trade and commerce in this general way? The object of the confusion is obviously to glorify Australia. It is nothing to say that the imports and exports of a country per head are six times those of another; it may mean little as to the comparative prosperity of either country; but to state that the trade of one is six times that of another is to affirm much greater activity, and presumably, greater prosperity.

“It appears, however, that Sir F. Bell has not given us the actual figures of imports and exports but in one case—that of the United Kingdom—a corrected figure. ‘It was in accordance with this principle’—a principle, he says, laid down by Mr. Giffen—‘that I deducted goods in transit, as is now always done; and I said in the paper that I had done so.’ I am sorry to say that in the copy of the paper before me I find no such explanation. I shall be obliged by Sir F. Bell referring to the passage. The want of it misled me. Assuming the explanation, however, I must dispute the statement that what is properly transit trade is now ‘always’ deducted; or that the deduction ought to be made, at any rate, in a comparison of foreign ‘trade.’ Trade is trade, although it may be of a different nature in different countries, and at least Sir F. Bell should have told us clearly in each case what he had done. I am sorry to say that, even with his present explanation, I cannot make out what he has done in the case of the United Kingdom to arrive at 571 millions. Taking his corrected figure of 285 millions for the imports, and correcting the exports of last year by omitting all re-exports, as he suggests, which would make

the exports about 194 millions, we should arrive at a total of 479 millions only for the trade of the United Kingdom. In what way, then, has Sir F. Bell arranged the figures, and what does he mean by 'trade'?

"Sir F. Bell concludes by acknowledging the invaluable assistance he has received from Mr. Mulhall, and by not pretending to be an authority himself; and by asking 'X. Y. Z.' 'to let us know the name we are to accept as convicting us of nonsense.' But, surely, in such matters there is no such thing as authority. I am quite content to let my criticism speak for itself. As Mr. Mulhall, if not Sir F. Bell, must very well know, no authority, however great, could compel the public to accept the statement that the death-rate in the United States is 22 per 1,000, without chapter and verse being given for it; while knowing what we know of the character of the people of the United States and Australia respectively, we should be entitled to disbelieve any statistics, however vouched for, which appeared to show that one Australasian does as much trade as six Americans. Do Sir F. Bell and Mr. Mulhall ask us to believe this on their own word? or is the figure in this case Sir F. Bell's only?

"I ought to add that I have only challenged some of the figures in the paper which appeared to me challengeable, as given without sufficient explanation or reference to original sources. A great deal more could be said, but all I have been anxious to do is to put those who read the paper upon inquiry and induce them to demand the references and explanations. It is the fault of the paper in more places than those I have named that difficult points of statistics are referred to in an easy manner, without any hint as to the intrinsic difficulties of good figures on the subject, or references to the data and methods of deduction followed.

"I am, Sir, your obedient servant,

"28th December.

X. Y. Z."

(*Times* of 1st January, 1883.)

"Sir,—It would not be right if I did not say at once that I submit without a murmur to the authority of Mr. Giffen, and hasten to express regret for having misunderstood him. Perhaps it is as well that a mere politician from the other side of the world should have a sharp lesson to keep out of controversy about doctrines which only an accomplished statistician can make quite clear.

"29th December.

I am &c.,

F. D. BELL."

"Sir,—I am unwillingly drawn into a controversy between 'X. Y. Z.' and Sir Dillon Bell, in which I owe it to the public to declare that I am responsible for all the statistics in his paper at the Colonial Institute, except as regards public debt. But I am not responsible for his reply to 'X. Y. Z.,' which was sent to the *Times* without my seeing it, and in which he incurred the error of deducting the value of raw material from British imports. Neither was I aware of his apology to Mr. Giffen which appeared in the *Times* of to-day.

"As I except public debt, I may observe that so far from say-

ing 'that 150 millions will be the outside of what Australasia will owe in 1900,' I stated in my brief for Sir Dillon Bell that the debt must increase as follows:—

Year.	Debt.	Population.	Debt per Inhabitant.
	£		£
1882	98,000,000	2,983,000	34
'90	154,000,000	4,202,000	37
1900	261,000,000	6,499,000	40

"It is needless here for me to give my reasons, but probably the result in 1890 will show how far my anticipation is correct. The point that I sought to establish was that the assets of Australia increase five times as fast as debt, that they have done so since 1870, and, as you have been kind enough to say that Sir Dillon Bell has substantially proved his case, the end of my labours is attained. It is, therefore, beside the question whether the natural increase of New Zealanders is greater or less than in the United States, whether Dr. Farr's life-tables are valuable or illusory, or whether 'British commerce' should include goods in transit. But as these points of Sir Dillon Bell's paper have been attacked, I cannot pass them over, although merely side issues.

"1. The Registrar-General of England (p. 3, Census report) defines the 'natural increment' of a people as 'the difference between the number of births and of deaths.' That difference in New Zealand in 1880 (Colonial Abstract) was 30 per 1,000, as stated by me. I have not gone into the causes.

"2. As to the United States' vital statistics of 'deaths 22, increase 18,' or, more correctly, 'deaths 18, increase 22,' whichever you adopt, will be very far short of the New Zealand rate of 30. As the figures have been transposed, I shall assume the error in transposing to be mine, but I have shown in my 'Balance Sheet of the World' (1881) that the natural increase of the United States was $21\frac{1}{2}$ per 1,000, and although the Census Commissioner, Mr. Porter, *Bradstreet's Journal*, and other authorities frequently quote my books on American statistics, no American writer has yet impugned my estimate of their vital statistics.

"3. As regards sickness tables, it was insinuated by 'X. Y. Z.' in his first letter that there were none, but he now admits those of Neison, Ratcliffe, &c. I attach much higher importance to Dr. Farr's life table (1853), where he lays down that the sick at any period will be double the number of deaths in the preceding year. As Dr. Farr is the highest living authority on vital statistics, I am justified in asserting that 'since the death-rate of New Zealand is half that of Great Britain, so will be the loss of time and labour from sickness.'

"4. Sir Dillon Bell's table of commerce was the amount of imports and exports for each country, less goods in transit, and 'X. Y. Z.' asserts that 'without counting transhipment' the commerce of the United Kingdom is about 700 millions, whereas I find

from the Board of Trade return, 1881, that it is only 568 millions, viz.:—

	£
Imports into United Kingdom	397,022,000
Deduct goods in transit	63,060,000
British imports	333,962,000
„ exports	234,023,000
	<u>567,985,000</u>

By counting goods in transit twice over, and thus adding 126,120,000*l.*, we get a nominal total of 694,100,000*l.*, but this is precisely including the transhipments which ‘X. Y. Z.’ professed to exclude.

“Thanking the *Times* for allowing both sides of the case to be heard, I remain, your obedient servant,

MICHAEL G. MULHALL.”

“81, Park street, W., 30th December.

“Sir,—In the recent correspondence respecting Sir Francis Bell’s interesting paper about Australasia, one important point in regard to the trade of these colonies seems to have been lost sight of.

“In the paper in question the annual trade, or rather imports and exports, of all the colonies in Australasia are stated to amount to 100 millions sterling, and from this figure Sir Francis Bell deduces the astonishing statement that one Australian does as much trade as two Englishmen or six Americans. It is, however, worth notice that about 35 millions, or more than a third of the amount in question, is intercourse between the Australasian colonies themselves—chiefly in transit—and that if a confederation or even a customs union be ever formed, this Australian trade will (on paper) suffer in a very marked manner, just as in the United States the absolute free trade which exists between the various States diminishes enormously the total figures of American trade by excluding records of the transactions between the different parts of this vast area.

I am, Sir, your obedient servant,

A. B. C.”

“London, 30th December.

(*Times of 3rd January, 1883.*)

“Sir,—If you will grant me space for this letter, I shall not ask you to let me add another line to a controversy which can have no further interest.

“The courteous and good natured tone of your correspondent ‘X. Y. Z.’s’ last letter deserves a better answer than I am going to give. But it is a fearful thing to see one’s name up and down two columns of the *Times* in five-and-twenty places, and I shudder at the very idea of any more of it. Of course this means that ‘X. Y. Z.’ will think I have admitted all he has said, and he is most welcome to think so if he likes.

“What I object to in both his letters is that they do not touch the fringe of the general argument of my paper. Elaborate disquisitions on the proper use of sickness tables, or the true meaning of natural increase, have their attraction for the statisticians, but do not fairly challenge the broad lines on which I was speaking at the Institute. I cannot think it would matter in the least if I had been as utterly wrong as ‘X. Y. Z.’ makes me out to be on any of the trivial points he dwells on in so much detail. As the *Times* has said, no assumption of mine, however rash, about averages on which the most accomplished statisticians are not agreed, can affect a proper estimate of the assets and liabilities of Australasia. Out of the twenty-six tables in my paper, only half-a-dozen went into any comparisons of the kind objected to by ‘X. Y. Z.’ and all the rest related to the public debt, population, revenue, industry, railways, and general assets of the seven colonies, the figures being either taken out by myself from official records or careful computations by Mr. Mulhall. If I had made fifty errors in mere illustration, the solidity of these figures would not be shaken, nor the significance be affected of one such fact as the one that, out of the 96 millions of our debt, 70 millions are for railways and other things nearly earning the interest we pay.

“Mr. Mulhall, in his letter, which I have this moment seen, refers to the difference between us as to the probable growth of the Australian debt. He still insists that, because our population may very likely be 7 millions by the end of the century, therefore our debt must then be 261 million pounds. To this I entirely demur. To say nothing of the United States, whose debt has been reduced by hundreds of millions since the civil war, I need only mention England, where the population is ever so many millions more than it was, and the debt ever so many millions less. It seems to me impossible to imagine that, even if the Australasians were mad enough to want to owe the money, the English capitalists would be fools enough to lend it; and if I had thought there was the remotest possibility of such a thing, I should have been ashamed to speak at the Colonial Institute at all.

“I am sorry ‘X. Y. Z.’ should have accused me of a deliberate object to create confusion of figures in order to ‘glorify Australia.’ That, I think, is going too far. I dared to ask that a little of the public interest which lavishes itself on the sorrows of Jumbo or the merits of a Pagliatti bust might be diverted for a moment to mark a stage in the story of some of England’s great dependencies. And if I might ask the *Times*, in accepting my thanks for its otherwise generous article, to forgive me a parting word, it would be to say that I tried at least to tell that story in the spirit that should govern founders of such dependencies, not after the fashion of one whose name is only now remembered as a by-word for the poor arts of puffery and chicanery.

“I am, &c.,

“1st January.

F. D. BELL.”

(*Times of 4th January, 1883.*)

“Sir,—Sir F. Bell and Mr. Mulhall have now replied, each on their own account, to my strictures on the figures in Sir F. Bell’s

paper on New Zealand. I have no reason to be dissatisfied with the issue of the correspondence. Sir F. Bell formally, and Mr. Mulhall virtually, decline to defend the points I attacked. I shall therefore only ask you to make room for one or two additional observations. The public, I feel, can hardly be expected to follow the details of a statistical criticism, however important the points in dispute may really be.

"1. Having failed to defend the points attacked, both writers seek to minimise the importance of the accusation. After all, they say, the main position as to the growth of Australasian assets in excess of the debt is not assailed, and all this discussion about sickness statistics, rates of mortality, &c., is on minor questions. I do not think people of sense will agree with them. The paper was a statistical one, bristling with figures, and without references. If some of the data are indefensible, the conclusion of the public must be that the paper as a whole is not 'safe.' There is no saying what other errors there may be. For myself I can say that after long experience with statistics, I should decline to pay any attention to a statistical paper in which I found the statistics handled in the way that I have described. I should know that I could not trust a figure without investigating it. Thus, the conclusion of the paper as to the solvency of Australia, and particularly New Zealand, may be sound, and most of the figures may also be correct; but the paper itself may be useless, because the figures are tainted. We cannot have any confidence that they are correct.

"2. The points I attacked were really very important and interesting—not, perhaps, in relation to Australasian statistics as a whole, but in themselves. As a statistician, knowing something of the state of the statistics about sickness, the vital statistics of America, and the trade of different countries, I was certainly surprised to find a comparison as to sickness between England and New Zealand, as if there were no difficulty in the matter; the statement of birth and death-rates for the United States, when the fact is that statisticians have for years lamented the defects of the United States' statistics on this head: and the allegation that one Australasian does six times as much trade as an American, which is obvious nonsense. The subjects of such statistical statements are clearly as important in themselves as the special topic of the paper; and the writers must have known, or ought to have known, that by their treatment of general matters which statisticians know something about, their competency to deal with that special topic would be judged.

"3. As to sickness statistics, specially, Mr. Mulhall errs in saying that I insinuated that there were no sickness statistics in England. On the contrary, my statement was most precise—that there were no sickness statistics applicable to the whole adult population; that his comparison must have been based on incomplete data. As to this incompleteness I may leave your readers to judge.

"4. As to the natural increment of the population, Mr. Mulhall seems to think it is enough for him to show that excess of births over deaths is spoken of as a natural increment, whereas my challenge related to the ratio of the excess of births over deaths to

population. Surely he must see as well as others that the excess of births over deaths in a community like that of New Zealand is not the natural increase of that community. In giving a ratio he selects a wrong population with which to compare the excess.

"5. The case as to the United States' figures has now become very bad. I asked in my first letter for the authority for three rates—the birth-rate, the death-rate, and the rate for the excess of births over deaths. Sir F. Bell replied by giving me an authority for the latter only, which I showed in my second letter to be inconsistent with the original figure put forward. The original figure was 18 per 1,000, and in the second 22 per cent. in ten years, whereas 18 per 1,000 per annum is only $19\frac{1}{2}$ per cent. in ten years. Now, Mr. Mulhall tells us quite bluntly that there has been a transposition of the figures—that the death-rate should have been 18 per 1,000, and the rate of the excess of births over deaths 22 per 1,000. We have no explanation, however, of the method of the latter estimate, while it is wholly inconsistent with Sir F. Bell's explanation. A rate of 22 per 1,000 per annum would come to 23·8 per cent. in ten years or thereabouts, instead of the $21\frac{1}{2}$ or 22 per cent. which Sir F. Bell gave us. Moreover, as I have stated, I asked for three rates—the birth-rate and death-rate, as well as the rate for the excess of the births over deaths. But as to the birth and death-rates there has not been a word.

"It is not to the point for Mr. Mulhall to say, 'Although the Census Commissioner, Mr. Porter, *Bradstreet's Journal*, and other authorities frequently quote my books on American statistics, no American writer has yet impugned my estimate of their vital statistics.' As I explained in my last letter, there is no 'authority' in these matters. Mr. Mulhall, like ordinary folks, should furnish his proofs when called on.

"6. As to the 'commerce' of the United Kingdom, Mr. Mulhall, without arguing, sticks to his identification of 'imports and exports' with 'commerce.' At this stage of the correspondence this is surely most absurd. Even Mr. Mulhall must know that 'imports and exports' and 'commerce' are not identical expressions. He now gives us, however, a different account of the calculation of 571 millions as the figure of British 'commerce'—that is, imports and exports—from what Sir F. Bell gave. He takes the imports, deducts from them the exports of foreign and colonial produce, so called, and then adds the exports of British produce, so called. What warranty he has for thus dealing with the figures for the purpose of the paper, which was to compare trade with trade, he does not explain. Still, it is something to know what was done in the paper, and, perhaps, after all this trouble, Mr. Mulhall will be good enough in future to follow the practice of other statisticians, and make clear what his figures are and how he gets them. If he had done so at first, much of this correspondence would have been saved, and it would have been quite evident to his hearers, as well as himself, that the figure of 571 millions was not the total of British trade, but something else.

"But Mr. Mulhall is not accurate even yet. He disputes the statement that the total imports and exports of the United

Kingdom, without transhipment, are 700 millions, and says the figure is 571 millions only, or rather 567 millions only. He adds: 'By counting goods in transit twice over, and thus adding 126,120,000*l.*, we get a nominal total of 694,100,000*l.*; but this is precisely including the transshipments which "X. Y. Z." professed to exclude.' Apparently, then, Mr. Mulhall is under the impression that transshipments and transit trade are identical. If he will refer to the Annual Statement of Trade of the United Kingdom and the Statistical Abstract, he will perceive his mistake. The 'transit' trade, which Mr. Mulhall excludes, is not 'transhipment.' It may include goods which are years in the country before being re-exported, and usually includes goods which are a longer or shorter period in the country, as well as goods strictly in transit, while no clear line can be drawn between them and what are called British exports, the latter comprising goods which are in a certain sense in transit as well as the former. Mr. Mulhall must not suppose that he has eliminated the transit trade in his 571 millions, or that it is very easy to do so as regards the United Kingdom, or any country with an important foreign trade.

"Permit me, in conclusion, to refer to a moral which was in my mind when this correspondence began, and which it well illustrates, viz., that the utmost good faith is necessary in all statistical papers, and that writers should either use official figures only or describe accurately what they do when they manipulate these figures, or when they resort to other sources for information. The characteristic fault of the paper I commented on was the constant employment of figures without references and without any means being furnished for tracing the figures to their sources. This was not the fault, perhaps, of Sir F. Bell, who thought it sufficient to rely on Mr. Mulhall, but it was, nevertheless, a fault of the most flagrant kind, which should never be committed.

I am, &c.,

X. Y. Z."

"January 3rd.

V.—*The Fires in London during the Year 1882, and the Metropolitan Fire Brigade.*

THE following particulars are taken from Captain Shaw's Report for 1882, to the Metropolitan Board of Works, in continuation of similar notices for previous years:—

"The number of calls for fires, or supposed fires, received during the year has been 2,341. Of these 254 were false alarms, 161 proved to be only chimney alarms, and 1,926 were calls for fires, of which 164 resulted in serious damage, and 1,762 in slight damage.

"These figures refer only to the regular calls for fires, or supposed fires, involving the turning out of firemen, fire engines, fire escapes, horses, and coachmen; they do not include trifling damages by fires which were not sufficiently important to require the attendance of firemen; neither do they include the ordinary calls

for chimneys on fire, which are separately accounted for further on.

“The fires of 1882, compared with those of 1881, show a decrease of 65; and compared with the average of the last ten years, an increase of 272.

“The following table gives the result both in actual numbers and percentages:—

Year.	Number of Fires.			Percentages.		
	Serious.	Slight.	Total.	Serious.	Slight.	Total.
1866.....	326	1,012	1,338	25	75	100
'67.....	245	1,152	1,397	18	82	100
'68.....	235	1,433	1,668	14	86	100
'69.....	199	1,373	1,572	13	87	100
'70.....	276	1,670	1,946	14	86	100
'71.....	207	1,635	1,842	11	89	100
'72.....	120	1,374	1,494	8	92	100
'73.....	166	1,382	1,548	11	89	100
'74.....	154	1,419	1,573	10	90	100
'75.....	163	1,366	1,529	11	89	100
'76.....	166	1,466	1,632	11	89	100
'77.....	159	1,374	1,533	10	90	100
'78.....	170	1,489	1,659	10	90	100
'79.....	159	1,559	1,718	9	91	100
'80.....	162	1,709	1,871	9	91	100
'81.....	167	1,824	1,991	8	92	100
'82.....	164	1,762	1,926	9	91	100

“The number of fires in the metropolis in which life has been seriously endangered during the year 1882 has been 108; and the number of these in which life has been lost has been 34.

“The number of persons seriously endangered by fire has been 175, of whom 139 were saved, and 36 lost their lives. Of the 36 lost, 22 were taken out alive, but died afterwards in hospitals or elsewhere, and 14 were suffocated or burned to death.

“The number of calls for chimneys has been 4,237. Of these 1,434 proved to be false alarms, and 2,803 were for chimneys on fire. In these cases there was no attendance of engines, but only of firemen with handpumps.

“The number of journeys made by the fire engines of the 54 land stations has been 28,778, and the total distance run has been 66,226 miles.

“The quantity of water used for extinguishing fires in the metropolis during the year has been 16,865,479 gallons—in round numbers nearly 17 million gallons, or about 75,292 tons. Of this quantity, about 9,061 tons, or about one-eighth of the whole was taken from the river, canals, and docks, and the remainder from the street pipes.

“During the year there have been 10 cases of short supply of water, 20 of late attendance of turncocks, and 10 of no attendance, making altogether 40 cases in which the water arrangements were unsatisfactory.

“ The strength of the brigade is as follows :—

- 54 land fire engine stations.
- 12 street stations.
- 124 fire escape stations.
- 4 floating „
- 3 large land steam fire engines.
- 38 small „
- 78 six-inch manual fire engines.
- 37 under six-inch manual fire engines.
- 144 fire escapes and long scaling ladders.
- 3 floating steam fire engines.
- 2 steam tugs.
- 4 barges.
- 52 hose carts.
- 14 vans.
- 13 waggons for street stations.
- 2 trollies.
- 2 ladder trucks.
- 49 telegraph lines.
- 17 telephone „
- 11 fire alarm circuits, with seventy-seven call points.
- 576 firemen, including chief officer, second officer, superintendents, and all ranks.

“ The number of firemen employed on the several watches kept up throughout the metropolis is at present 117 by day and 249 by night, making a total of 366 in every twenty-four hours ; the remaining men are available for general work at fires.

“ Our list of wounds and other injuries for 1882 is unusually large ; but considering the risks to which all ranks have been exposed, and the way in which the work has been done, it cannot be thought excessive. This list is generally heavy.

“ The ordinary work of the past year has been as usual very severe, but all ranks have exerted themselves with the utmost zeal and goodwill.

“ The duty which was cast on me of inspecting and reporting on all the theatres of the metropolis, occupied me from the 10th of February to the 25th July, 1882, a period of over five months. This was the most laborious task which I have ever been called upon to undertake, and I could not have accomplished it without the willing and unceasing aid of all ranks serving with me. I desire to place on record my cordial acknowledgment of these valuable services, which, though involving thousands of hours of extra labour, were rendered to me with a readiness and cheerfulness for which I cannot be sufficiently grateful.

“ The condition of the brigade with regard to discipline and general efficiency is perfectly satisfactory.”

The following particulars are obtained from the tables appended to the report :—

(a) The fires classified according to occupations, arranged in the order of frequency of occurrence ; to which are added, for the pur-

pose of comparison, the corresponding figures for the three previous years :—

Number.	Occupations.	Number of Fires.			
		1882.	1881.	1880.	1879.
1	Private houses	423	427	342	399
2	Lodgings	235	236	247	172
3	Vietuallers	58	68	53	58
4	Grocers	44	33	39	20
5	Boot and shoe makers	36	30	49	24
6	Coffee houses	31	33	31	32
7	Cabinet makers	30	38	27	30
8	Oil and colourmen	30	32	40	29
9	Tailors, clothiers, and outfitters	28	26	33	25
10	Builders	27	32	34	24
11	Booksellers, binders and stationers	26	24	23	18
12	Greengrocers and fruiterers	26	23	16	25
13	Bakers	23	16	21	15
14	Printers	22	18	15	11
15	Tobacconists	22	19	17	27
16	Under repairs and building	22	25	24	23
17	Unoccupied	22	31	14	10
18	Drapers	21	32	35	30
19	Stables	21	13	12	23
20	Confectioners and pastrycooks	19	9	15	11
21	Refreshment rooms	19	18	22	10
22	Chandlers	18	9	23	13
23	Hatters	18	9	10	7
24	Furniture makers and dealers	16	19	14	12
25	Offices	16	24	16	17
26 {	Carpenters and workers in wood (not }	15	8	15	17
	cabinet makers)				
27	Railways	14	9	10	15
28 {	Chemists, and laboratories for chemical }	13	8	8	11
	purposes				
29	Hotels and club houses	13	23	18	11
30	Wardrobe dealers	13	5	3	8
31	Warehouses	13	12	12	1
32	Engineers and machinists	12	14	11	12
33	Milliners and dressmakers	12	7	9	6
34	Fried fish shops	11	9	4	5
35	Laundries	11	10	10	9
36	Carriers	10	4	4	7
37	Cheesemongers	10	12	6	6
38	Coal and coke merchants	10	8	11	12
39	Corn dealers	10	16	13	7
40	Hairdressers	10	8	3	9
41	Rag merchants	10	7	6	3
42	Wine and spirit merchants	10	9	15	7
		1,450	—	—	—
	Remainder, varying from 9 to 1	476	—	—	—
		1,926	—	—	—

(b) A list of the fires classified under the causes to which they

have been assigned, and arranged in the order of frequency of occurrence:—

	Causes.	Number of Fires.
1.	Unknown	537
2.	Lamps (not gas) and lights (thrown down)	322
3.	Gas (in various ways)	174
4.	Sparks from fires, &c.	158
5.	Defective, or improperly set—flues, ovens, furnaces, boilers, stoves, &c.	138
6.	Candles	106
7.	Overheating of—flues, ovens, furnaces, boilers, stoves, &c.	86
8.	Children playing with fire, matches, &c.	78
9.	Hot ashes	71
10.	Foul flues	46
11.	Boiling over, or upsetting of fat, pitch, &c.	36
12.	Airing linen and drying stoves	30
13.	Lucifer matches.....	25
14.	Smoking tobacco	22
15.	Spirits, or vapour of spirits, in contact with flame	21
16.	Doubtful	16
17.	Lime slaking by rain and otherwise	16
18.	Spontaneous ignition.....	9
19.	Plumbers at work	6
20.	Fire, clothes coming in contact with	4
21.	Friction of machinery	4
	Miscellaneous, varying from 3 to 1.....	21
	Total	1,926

(c) The following table giving the totals of the fires for each day of the week for the last ten years, shows on the average that the largest number of fires occur on Saturday and the smallest number on Monday. The annual average number of fires for the last ten years is 1,698:—

Years.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.	Total.
1873....	202	209	237	199	230	243	228	1,548
'74....	222	228	228	195	240	231	229	1,573
'75....	200	203	231	227	236	209	223	1,529
'76....	260	218	226	235	242	221	230	1,632
'77....	192	218	212	224	243	216	228	1,533
'78....	260	191	271	234	214	236	253	1,659
'79....	235	212	231	257	264	251	268	1,718
'80....	288	262	253	259	254	266	289	1,871
'81....	270	267	315	288	279	253	319	1,991
'82....	285	246	296	267	281	274	277	1,926
Total...	2,414	2,254	2,500	2,385	2,483	2,400	2,544	16,980

VI.—*German Literature of 1881 and 1882.*

THE following is taken from the *Publishers' Circular* of the 15th February, 1883:—

“Systematic view of the literary productions of the German bookselling trade in 1881 and 1882, extracted from the *Börsenblatt*:—

	1881.	1882.
1. Collections or sets of works—literary history, } bibliography	411	365
2. Divinity	1,472	1,373
3. Law, politics, statistics, trade	1,469	1,355
4. Medicine, veterinary	817	847
5. Natural history, chemistry, pharmacy	924	799
6. Philosophy	148	158
7a. Education, German school-books, physical } education	1,924	1,990
7b. Juvenile books	490	404
8. The classics and oriental languages, anti- } quities, mythology	574	559
9. Modern languages, old German	461	487
10. History, biography, memoirs, letters	779	783
11. Geography and travel	352	370
12. Mathematics and astronomy	186	190
13. War, hippology	367	345
14. Mercantile science, technology	626	675
15. Engineering, mechanics, mining, nautical	463	365
16. Sport and forestry	99	99
17. Domestic economy, agriculture, gardening	417	388
18. Belles lettres, novels, poems, drama, &c.	1,226	1,260
19. Fine arts—painting, music, &c.; shorthand	581	529
20. Popular literature, almanacks	639	654
21. Freemasonry	23	28
22. Miscellaneous	402	416
23. Maps	341	355
Total	15,191	14,794

VII.—*English Literature in 1882.*

THE following particulars are taken from the *Publishers' Circular* of 30th December, 1882, in continuation of a series of similar extracts for previous years:—

“In presenting our readers, as we have been wont to do for many a year, with a table which gives an approximate idea of publishing activity during the past year, we can offer but little in the way of remark. Indeed, we have scarcely more than to repeat the observations of a twelvemonth since. The extraordinary activity which prevails in the departments of Journalism and of Periodical Literature must make itself felt in the shape of inroads upon the time of readers of books. It is not surprising, therefore, that one should have to notice a pause, as it were, in the growth of figures which one has been accustomed to regard as necessarily on the increase. Indeed, there actually is, it would appear, a very slight

falling off in the production of books proper during 1882. There is no standing out against the statistics as we find them; but, considering the variety and extent of the rival demands upon attention, the real wonder is that the effect is not more marked. As matters are, it is not improbable that the real value of the literary works of 1882, whether viewed from an intellectual or from a material standpoint, is superior to that of its forerunners.

Analytical Table of Books Published in 1882.

Subjects.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total of Books on each Subject for the Year.
Theology, sermons, biblical, &c.	*29 † 7	65 11	33 14	58 13	35 25	50 14	44 8	25 17	30 11	43 19	79 19	105 35	596 193
													789
Educational, classi- cal, and philo- logical	*29 † 3	51 4	44 11	45 10	25 9	25 6	22 5	30 5	30 3	31 11	53 8	47 15	435 90
													525
Juvenile works and tales	*16 † 2	37 7	27 8	32 13	29 21	24 19	42 19	53 17	32 14	152 38	147 59	136 43	727 260
													987
Novels, tales, and other fiction	*10 † 2	34 11	26 12	41 4	25 6	37 18	26 21	11 18	16 6	17 8	34 7	29 11	306 124
													420
Law, jurisprudence, &c.	* 2 † 1	13 —	4 2	2 4	2 —	2 —	3 1	2 —	3 6	4 3	6 2	9 4	52 23
													75
Political and social economy, trade and commerce	* 3 † 1	10 2	20 10	19 4	17 3	16 5	18 2	8 4	5 2	5 —	9 4	15 7	145 44
													189
Arts, science, and illustrated works }	*13 † 1	24 3	14 8	20 9	21 5	28 6	17 9	11 4	23 10	17 8	34 8	42 9	264 80
													344
Voyages, travels, and geographical research	* 5 † —	14 1	8 1	12 4	11 1	12 2	9 2	22 4	20 3	20 6	33 7	38 9	204 40
													244
History, biography, &c.	*13 † 2	28 2	23 8	33 6	19 7	23 8	21 6	13 6	23 7	31 9	59 6	75 24	361 91
													452
Poetry and the drama	* 9 † —	5 —	10 1	15 2	6 1	10 3	9 3	12 2	9 2	22 1	25 3	26 5	158 23
													181
Year books and serials in volumes }	*24 † 2	40 —	21 2	6 1	5 2	12 1	13 1	13 2	1 —	5 —	35 —	77 3	255 14
													269
Medicine, surgery, &c.	* 1 † 1	6 2	11 3	11 6	6 2	9 8	16 8	7 6	7 —	13 7	23 7	9 8	119 58
													177
Belles lettres, essays, monographs, &c. }	* 9 † 2	14 1	20 4	5 —	9 2	10 2	7 —	4 —	3 —	1 1	6 2	4 —	92 14
													106
Miscellaneous, in- cluding pamphlets, not sermons	* 7 † —	7 —	13 7	24 8	23 7	27 13	27 17	16 10	18 4	26 6	33 11	43 9	264 92
													356
	194	382	365	407	324	390	376	322	288	517	722	837	5,124

“The analytical table is divided into fourteen classes; also new books and new editions:—

Divisions.	1881.		1882.	
	New Books.	New Editions.	New Books.	New Editions.
Theology, sermons, biblical, &c.....	744	201	596	193
Educational, classical, and philological...	539	143	435	90
Juvenile works and tales.....	392	108	727	260
Novels, tales, and other fiction	446	228	306	124
Law, jurisprudence, &c.	69	64	52	23
Political and social economy, trade and } commerce	136	26	145	44
Arts, sciences, and illustrated works.....	344	108	264	80
Voyages, travels, geographical research ..	200	91	204	40
History, biography, &c.	356	81	361	91
Poetry and the drama.....	111	37	158	23
Year books and serials in volumes	335	4	255	14
Medicine, surgery, &c.	108	56	119	58
Belles lettres, essays, monographs, &c.	149	98	92	14
Miscellaneous, including pamphlets, } not sermons	181	51	264	92
	4,110	1,296	3,978	1,146
	5,406		5,124	

VIII.—Additions to the Library.

Additions to the Library during the Quarter ended 31st March, 1883.

Donations.	By whom Presented.
Argentine Republic. BUENOS AIRES. Boletín de la Oficina de Estadística. Año ii, Núm. 3. (Births, Deaths, and Marriages, Agricultural Products, &c.) La. Svo. Buenos Aires, 1882	The Statistical Bureau of the Province of Buenos Aires
Austria and Hungary— AUSTRIA— <i>Nachrichten über Industrie, Handel und Verkehr aus dem Statistischen Departement im K. K. Handels-Ministerium.</i> XXIV Band. La. Svo. Wien, 1882— IV Heft. Hauptergebnisse der österreichischen Eisenbahn-Statistik im Jahre 1881. (Railway Statistics) V Heft. Werthe für die Mengeneinheiten der im Jahre 1881 im österreichisch-ungarischen Zollgebiete ein- und ausgeführten Waaren. (Value of Imports and Exports)	Dr. Brachelli

Donations—Contd.

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Austria and Hungary—Contd.	
<i>Statistisches Jahrbuch für 1882.</i> La. 8vo. Wien—	
III und IV Heft. Gewerbliche Industrie, Handel, Eisenbahnen, Strassen, Fluss- und See Schifffahrt, Post, Telegraphen. (Industries, Trade, Railways, Roads, Navigation, Postal Service, Telegraphs)	The Imperial Central Statistical Commission of Austria
V Heft. Volksschulen. Summarische Uebersicht sämmtlicher Lehranstalten. (Primary Schools)	
HUNGARY. Ergebnisse der in den Ländern der ungarischen Krone am anfang des Jahres 1881, Vollzogenen Volkszählung, sammt nachweisung einiger nutzbaren Hausthiere. (Census.) Band i, ii. Folio. Budapest, 1882	The Royal Hungarian Statistical Bureau
PRAGUE. Týdenní zpráva o úmrtích v Praze a o oběh spojených, kteréž, jsou, &c. (Weekly Returns of Deaths)	
Belgium. VILLE DE BRUXELLES. Bulletin Hebdomadaire de Statistique, Démographique, et Médicale. (Current numbers)	Dr. E. Janssens, Brussels
China—	
<i>Imperial Maritime Customs.</i> 4to. Shanghai.	
I. Statistical Series. No. 2. Customs Gazette. Quarterly Returns of Trade, &c. July—September, 1882	Sir Robert Hart, K.C.M.G., Pekin
II. Special Series. No. 2. Medical Reports for the Half-year ended 31st March, 1882. 23rd issue	
III. Miscellaneous Series. No. 6. List of the Chinese Lighthouses, Light-Vessels, Buoys, and Beacons for 1883. Eleventh Issue	
Denmark—	
Betænkning over Tarifen og andre dermed i Forbindelse staaende Forhold i den almindelige Brandforsikringsforening for Landbygninger støttet par statistiske Undersogelser for Tidsrummet 1874-82. 78 pp., folio. Kjöbenhavn	H. Westergaarde, Esq., Copenhagen
Statistiske Meddelelser, Tredie Række, 4 ^{de} Bind. 342 pp., 8vo. Kjöbenhavn, 1882 (Harvests, Prices of Cereals, Population, Abuse of Alcohol)	
<i>Statistisk Tabelværk.</i> La. 4to. Kjöbenhavn, 1882—	
Fjerde Række, Litra C., Nr. 3. Kreaturholdet den 15 ^{de} Juli, 1881 (Live Stock)	The Royal Statistical Bureau of Denmark
Fjerde Række, Litra D., Nr. 5. Vare-Indførselen og Udførselen, Handels-Flaaden, Skibsfarten samt Brændevins-Frembringelsen, m.m. i Aaret, 1881. (Weights and Measures, Commerce, Shipping, Manufacture of Brandy, &c.)	
Nationalökonomisk Tidsskrift, 11 ^{te} —12 ^{te} Hefte. Kjöbenhavn, 1882	The Danish Political Economy Society
Egypt. Crédit Lyonnais. Société Anonyme. Bulletin Financier et Commercial. No. 212. 1883.....	J. Rabino, Esq.

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Ministère des Finances. Bulletin de Statistique et de Législation comparée. Décembre, 1882; Janvier et Février, 1883	M. A. De Foville
Ministère des Travaux Publics. Bulletin du—. Décembre, 1882; Janvier, 1883	
	The Ministry of Public Works
L'Economiste Français. (Current numbers.) Paris.....	The Editor
<i>Révue Bibliographique Universelle</i> , Paris:—	
Partie Littéraire. Dec., 1882, Jan.—Mars, 1883	"
Partie Technique. Dec., 1882, Jan.—Mars, 1883....	
Révue Géographique Internationale. Nos. 82 et 83, 6 ^e année, 1882; Nos. 87 et 88, 8 ^e année, 1883	"
Société de Statistique de Paris. Journal de la—.	
Jan.—Mars, 1883:—	
(Tables des Matières.)	
Janvier. Ouverture des conférences fondées par la Société de statistique de Paris. La mortalité comparée des enfants légitimes et naturels en 1879, pendant la première année de leur âge. Le certificat d'études primaires, son origine et ses résultats. La prostitution en France d'après les recherches du Dr. Desprès. Variétés	The Society
Février. Discours prononcé par M. Cheysson pour l'inauguration de sa présidence, dans la séance du 17 janvier, 1883. Rapport sur l'institution d'un prix annuel à décerner par la Société de statistique de Paris. Les banques aux États-Unis. L'alimentation de Paris en viande de boucherie, 1879-81). Les côtes foncières en 1881. La situation financière des communes de France en 1806, 1864, et 1877. Variétés.	
Mars. Aperçu des résultats généraux de la démographie appliqués à l'économie politique. La récidive. Le mouvement télégraphique en Europe pendant l'année 1881. Mort du Dr. Bertillon.....	
Germany—	
<i>Monatshefte zur Statistik des Deutschen Reichs für das Jahr 1882.</i> La. 4to. Band LII—	
Heft 11. Durchschnittspreise für November, 1882. Waarenverkehr im November, 1882. Versteuerte Rübenmengen, &c., im November, 1882	The Imperial Statistical Office, Berlin
Heft 12. Produktion und Besteuerung sowie Ein- und Ausfuhr von Zucker, 1881-82. Vorläufige Uebersicht über die Ergebnisse der Rübenzucker Fabrikation, 1882-83. Durchschnittspreise für 1882. Waarenverkehr im Dezember, 1882. Versteuerte Rübenmengen &c., im Dezember, 1882	
— Band LIX. 1883.	
Heft 1. Anordnungen für die Reichsstatistik, 1882. Besteuerung des Tabacks, Ein- und Ausfuhr, &c., während des Erntejahres 1881-82. Nachtrag zur Statistik über Produktion und Besteuerung, sowie Ein- und Ausfuhr	

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Germany—Contd.	
<i>Monatshefte zur Statistik des Deutschen Reichs—Contd.</i> von Zucker für 1881-82. Ueberseeische Auswanderung, 1882. Eheschliessungen, Geburten und Sterbefälle, 1881. Durchschnittspreise wichtiger Waaren im Grosshandel für Januar, 1883. Waarenverkehr im Januar, 1883. Versteuerte Rübenmengen, sowie Ein- und Ausfuhr von Zucker im Januar, 1883	The Imperial Statistical Office, Berlin
Preussische Statistik. La. 4to. Berlin, 1882.....	
Heft LVIII. Die Irrenanstalten im preussischen Staate in den Jahren 1877-79. (Lunatic Asylums)	
<i>Berlin—</i>	
Geburts und Sterblichkeits, Verhältnisse der Stadt im Jahre 1882. Vorläufige Uebersicht aufgestellt für das Kaiserliche Gesundheits Amt. (Sheet.) (Birth and Death-Rate)	The Statistical Bureau of Berlin
Veröffentlichungen des Statistischen Amtes der Stadt—Eheschliessungen, Geburten, Sterbefälle und Witterung. (Weekly Returns of Marriages, Births, Deaths, &c.)	
Guatemala. Movimiento de Poblacion habido en los Pueblos de la República de Guatemala durante el año de 1881. v + 67 pp., sm. folio. Guatemala	The Secretary of State for Internal Industry, Guatemala
Italy—	
<i>Annali dell' Industria e del Commercio, 1882.—</i> Atti della Commissione per lo Studio delle disposizioni Intese a Promuovere i consorzi d'acqua a Scopo Industriale. 8vo. 1883	The Director-General of Statistics, Rome
Testo Unico delle Leggi sui Magazzini Generali. 8vo.	
Atti della Giunta per la Inchiesta Agraria e sulle condizioni della Classe Agricola. Vol. iv, fascicolo ii. Le condizioni della Proprieta Rurale e della Economia Agraria nel Veneto. 4to. 1883	
Bilanci Provinciali Preventivi, Anni 1880-81. La 8vo.	
Bollettino Settimanale dei Prezzi, di alcuni dei principali Prodotti Agrari e del Pane. (Current numbers.)	
Bollettino di Notizie Commerciali. (Current numbers.)	
Bollettino Consolare. Vol. xviii, fasc. xi e xii. 1882. Vol. xix, fasc. i, 1883	
Bollettino Mensile dell Situazioni dei Conti degli Istituti d'Emissione. Anno XIII; No. 11. 1882	
Bollettino Bimestrale delle Situazioni dei Conti. Anno XIII; No. 4, 1882	
Bollettino Bimestrale del Risparmio. Anno VII; No. 5. 1882	
Censimento del Bestiame Asinino, Bovino, Ovino, Coprino e Suino, 1881. 91 + cclxxxiii + 464 pp., maps. la. 8vo.	
Notizie intorno alle condizioni dell' Agricoltura negli anni 1878-79. Vol. iii, 896 pp., plates, la. 8vo.	
Statistica della Emigrazione Italiana all' Estero nel 1881. Confrontata con quella degli anni precedenti e coll' Emigrazione avvenuta da altri Stati. xliii + 310 + 146 pp., diagrams, la. 8vo.	

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Résumé Statistique pour le Royaume des Pays-Bas, 1850-81. (Publication de la Société de Statistique des Pays-Bas.) lvii + 179 pp., la. 8vo. La Haye, 1882	D. Nutt, Esq., London
Statistiek der Geboorten en der Sterfte naar den Leeftijd en de oorzaken van den dood in Nederland. Julij—Sep., 1882.....	
Statistiek van het Gronderediet in Nederland over de Jaren 1879 en 1880. 97 pp., 4to. 's Gravenhage, 1882	The Statistical Society of the Netherlands
	The Netherland Legation, London
Portugal—	
LISBOA. Boletim da Sociedade de Geographia de— 3 ^a serie, Nos. 3—6. 1882	The Society
Société de Géographie de Lisbonne. La Question du Zaire. Droits du Portugal. Memorandum. Édition française. 79 pp., la. 8vo. Lisbonne, 1883	
Russia—	
Annuaire des Finances Russes. Par A. Vessélovsky. 11 ^{me} Année. 543 pp., la. 8vo. St. Pétersbourg, 1883	M. A. Vessélovsky
Règlement Définitif du Budget de l'Empire pour l'exercice, 1881. Rapport présenté au Conseil de l'Empire par S. Exe. M. le Contrôleur de l'Empire. 47 pp., la. 8vo. St. Pétersbourg, 1883	
Tableau du Commerce Extérieur de la Russie de 1856 à 1871. Par A Vessélovsky, Commission Impériale Russe de l'Exposition Universelle de Vienne en 1873. vii + 203 pp., la. 8vo. St. Pétersbourg, 1873.....	
Spain—	
MADRID. Boletín de la Sociedad Geográfica de—. Tomo xiii, Núm. 5, 6. Tomo xiv, Núm 1	The Society
Memorias Comerciales y Suplemento. (Current numbers)	The Board of Customs, &c.
Revista Topográfica y Estadística. (Current numbers)....	The Editor
Sweden and Norway—	
NORWAY—	
Norges Officielle Statistik. La. 8vo., Kristiania, 1882 }	The Central Statistical Bureau, Christiania
B. 1. Criminalstatistiske Tabeller for Kongeriget Norge for Aaret 1879 (Criminal Statistics) }	
C. 1. Bidrag til en norsk Befolkningsstatistik Indledning til Tabeller indeholdende Resultaterne af Folketællingen i Norge i Januar, 1876 (Census of 1876)	
C. 1. Tabeller vedkommende Folkemængdens Bevægelse i Aarene 1876-80. IV Tabeller for Aaret 1877. (Movement of Population)	
C. 16. Uddrag af Aarsberetninger fra de forenede Rigers Konsuler for Aaret 1881 (Consular Reports ; four numbers)	
Meddelelser fra det statistiske Centralbureau. No. 7, for 1882 (Journal of the Central Statistical Bureau)	

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Statistiske Tabeller over Døvtumme, Blinde og aandsvage Børn i Kongeriget Norge (1881) (Statistics of Deaf Mutes, of the Blind, and of Imbecile Children)	The Central Statistical Bureau, Christiania	
SWEDEN—		
Sveriges Officiella Statistik. La. 4to. 1882-83—		
C. Bergshandteringen, Commerce-Collegii underdåniga Berättelse för år 1881 (Mines and Miners, Minerals and Metals)	The Central Statistical Bureau, Stockholm	
G. Fångvården. Ny följd XXIII. Fångvårds-Styrelsens underdåniga Berättelse för år 1881 (Prisons)		
L. Statens Jernvägstrafik 20. a. Trafik-Styrelsens Underdåniga Berättelse för år 1881. Diagram. (Railways)		
M. Postverket. 17. Generalpoststyrelsens den 25 November, 1882, i underdånighet afgifna Berättelse om Postverkets Förvaltning under år 1880. Tillägg till årsberättelsen den 31 December, 1881. (Postal Service)		
M. Postverket. 18; I. Generalpoststyrelsens Berättelse om Postverkets Förvaltning under år 1881. (Postal Service)		
S. Allmänna Arbeten. 10. Styrelsens för Allmänna Väg-och Vattenbyggnader Underdåniga Berättelse för Året 1881. (Public Works)		
U. Kommunernas Fattigvård och Finanser. VII. Statistiska centralbyråns underdåniga Berättelse för år 1880		
Rikets in-och Utførsel af vissa varor Jan.—Dec., 1878-82. (Sheets.) Stockholm. (Imports and Exports)		
Sammandrag af Generaltullstyrelsens underdåniga Berättelse, angående 1882 års tulluppbörd jemte särskilda anslag, afkortningar och omkostnader m.m., jemförda med de fem nästföregående årens 1877-82. (Sheet.) Stockholm, 1883		
Sammandrag af Riksbankens Ställning den 31 Juli—30 Dec., 1822. (Sheets.) Stockholm. (Monthly Bank Return)		
Sammandrag af de Solidariska Enskilda Bankernas samt Aktiebankernas och Kreditaktiebolagens Uppgifter för den 31 Juli—31 Dec., 1882. (Six numbers.) La. 4to. Stockholm		
Statistisk Tidskrift. No. 3, 1882. (Journal of the Central Statistical Bureau, Stockholm)		
United States—		
Department of Agriculture. Special Reports. 8vo.		
No. 53. Report upon the Product and Price of principal Crops of 1882; also Freight Rates of Transportation Companies, including changes of the Winter Tariff. December, 1882	The Department of Agriculture	
No. 54. The Sorghum Sugar Industry. An Address by the Hon. George B. Loring, United States Commissioner of Agriculture		

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United States—Contd.	
<i>Bureau of Statistics. Commercial Relations—</i>	
Reports of Consuls on Commerce, Manufactures, &c. No. 24, October, 1882	The Bureau of Statistics, Washington
Cereals of Europe, India, and Algeria. Reports from the Consuls of the United States in answer to a circular. No. 25½, November, 1882	
Quarterly Reports on Imports, Exports, Immigration, and Navigation. No. 1. 1882-83 (to 30th September, 1882)	
Summary Statement of Imports and Exports. Nos. 4—6. 1882-83	The Bureau of Statistics
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Journal des Economistes	"	8vo. Paris. 1882.
Directory of Directors for 1883.	8vo.	
Medical Directory for 1883.	8vo.	
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REGISTRATION OF THE UNITED KINGDOM.

No. I.—ENGLAND AND WALES.

MARRIAGES—To 30th SEPTEMBER, 1882.

BIRTHS AND DEATHS—To 31st DECEMBER, 1882.

A.—*Serial Table of MARRIAGES, BIRTHS, and DEATHS, returned in the Years 1882-76, and in the QUARTERS of those Years.*

Calendar YEARS, 1882-76 :—Numbers.

Years	'82.	'81.	'80.	'79.	'78.	'77.	'76.
Marriages No.	—	197,290	191,965	182,082	190,054	194,352	201,874
Births..... „	888,940	883,642	881,643	880,389	891,906	888,200	887,968
Deaths „	516,783	491,935	528,624	526,255	539,872	500,496	510,315

QUARTERS of each Calendar Year, 1882-76.

(I.) MARRIAGES :—*Numbers.*

<i>Qrs. ended last day of</i>	'82.	'81.	'80.	'79.	'78.	'77.	'76.
March..... No.	39,791	38,043	41,238	35,956	39,137	39,704	41,559
June „	52,766	50,370	45,844	46,623	48,584	49,065	51,327
September „	50,989	48,607	47,703	45,121	46,628	47,743	49,160
December „	—	60,270	57,180	54,382	55,705	57,840	59,828

(II.) BIRTHS :—*Numbers.*

<i>Qrs. ended last day of</i>	'82.	'81.	'80.	'79.	'78.	'77.	'76.
March..... No.	223,802	225,451	221,699	226,056	220,792	230,241	230,080
June „	227,429	225,303	232,920	220,966	228,620	223,249	226,097
September „	220,118	215,966	219,023	218,668	222,604	213,195	216,302
December „	217,591	216,922	208,001	214,699	219,890	221,515	215,489

(III.) DEATHS :—*Numbers.*

<i>Qrs. ended last day of</i>	'82.	'81.	'80.	'79.	'78.	'77.	'76.
March..... No.	140,324	138,312	145,787	155,916	139,373	134,931	142,218
June „	125,078	120,811	125,366	132,003	129,096	131,244	126,239
September „	118,114	110,204	131,241	103,919	129,664	109,467	119,977
December „	133,267	122,608	126,230	134,417	141,739	124,854	121,881

*Annual Rates of MARRIAGES, BIRTHS, and DEATHS, per 1,000 PERSONS
LIVING in the Years 1882-76, and in the QUARTERS of those Years.*

Calendar YEARS, 1882-76:—General Ratios.

YEARS.....	'82.	Mean '72-81.	'81.	'80.	'79.	'78.	'77.	'76.
Estmtd. Popln. of England in thousands in middle of each Year....	26,407,	—	26,055,	25,709,	25,367,	25,029,	24,696,	24,367,
Persons Mar- ried	—	16·1	15·1	14·9	14·4	15·2	15·7	16·5
Births	33·7	35·3	33·9	34·2	34·7	35·6	36·0	36·3
Deaths.....	19·6	21·0	18·9	20·5	20·7	21·6	20·3	20·9

QUARTERS of each Calendar Year, 1882-76.

(I.) PERSONS MARRIED:—Ratio per 1,000.

<i>Qrs. ended last day of</i>	'82.	Mean '72-81.	'81.	'80.	'79.	'78.	'77.	'76.
March	12·2	13·3	11·8	12·9	11·5	12·7	13·0	13·7
June.....	16·0	16·3	15·5	14·3	14·7	15·6	15·9	16·9
September	15·3	15·7	14·8	14·7	14·1	14·8	15·3	16·0
December	—	19·0	18·4	17·6	17·0	17·7	18·6	19·5

(II.) BIRTHS:—Ratio per 1,000.

<i>Qrs. ended last day of</i>	'82.	Mean '72-81.	'81.	'80.	'79.	'78.	'77.	'76.
March	34·4	36·4	35·1	34·6	36·1	35·8	37·8	37·9
June.....	34·5	36·0	34·7	36·3	34·9	36·6	36·3	37·2
September	33·1	34·5	32·9	33·8	34·2	35·3	34·2	35·2
December	32·7	34·4	33·0	32·1	33·6	34·9	35·6	35·1

(III.) DEATHS:—Ratio per 1,000.

<i>Qrs. ended last day of</i>	'82.	Mean '72-81.	'81.	'80.	'79.	'78.	'77.	'76.
March	21·6	23·4	21·5	22·7	24·9	22·6	22·2	23·4
June.....	19·0	20·6	18·6	19·6	20·9	20·7	21·3	20·8
September	17·7	19·2	16·8	20·3	16·3	20·6	17·6	19·5
December	20·0	20·9	18·7	19·5	21·0	22·5	20·1	19·8

B.—Comparative Table of CONSOLS. PROVISIONS. COAL, and PAUPERISM in each QUARTER of 1880-81-82.

Quarters ending	Average Prices of						PAUPERISM.	
	CONSOLS (for Money) per 100l. Stock.	DISCOUNT charged by the Bank of England.	WHEAT per Quarter in England and Wales.	MEAT per Pound at the Metropolitan Meat Market (by the Carcase), with the Mean Prices.		COAL (Seaborne) in the London Market per Ton.	Quarterly Average of the Number of Paupers Relieved on the Last Day of each Week.	
				Beef.	Mutton.		In-door.	Out-door.
1880	£		s. d.	d. d. d.	d. d. d.	s. d.		
Mar. 31	98	3'00	45 1	4—7 ⁵ / ₈	4½—8¼	14 10	182,836	595,908
June 30	98 ⁷ / ₈	2'93	46 1	4¼—8½	5—9 ³ / ₈	14 5	168,661	555,196
Sept. 30	98	2'50	43 —	4¼—7¾	4½—8¼	14 6	162,879	539,670
Dec. 31	99¼	2'62	43 1	4¾—7¼	5¼—8¼	16 1	177,442	513,239
1881								
Mar. 31	99½	3'19	42 3	4¾—7¼	5—9	16 —	191,578	591,071
June 30	101 ⁵ / ₈	2'65	44 6	4¼—7	5—9¼	15 1	173,074	558,941
Sept. 30	100¼	3'14	48 10	4½—7¼	5¼—9	15 8	164,567	538,057
Dec. 31	99 ⁵ / ₈	4'93	45 10	4½—7½	5—8¾	17 2	178,058	539,517
1882								
Mar. 31	100 ³ / ₈	4'93	45 5	4½—7½	5½—9¼	15 —	187,202	560,513
June 30	101 ⁷ / ₈	3'00	46 9	5—8	5½—9½	14 9	170,546	512,134
Sept. 30	99 ⁷ / ₈	3'67	47 3	5—8¼	5¾—9 ³ / ₈	16 5	165,280	529,921
Dec. 31	101 ⁵ / ₈	5'00	40 8	4½—8¼	5¾—9¾	17 2	180,228	531,357

C.—Special Average Death-Rate Table:—ANNUAL RATE of MORTALITY per 1,000 in TOWN and COUNTRY DISTRICTS of ENGLAND in each Quarter of the Years 1882-80.

	Area in Statute Acres.	Population Enumerated 1881.	Quarters ending	Annual Rate of Mortality per 1000 in each Quarter of the Years			
				1882.	Mean '72-81.	1881.	1880.
In 134 Districts, and 57 Sub-districts, comprising the Chief Towns	3,184,419	15,444,808	March ..	23·2	24·9	22·9	23·9
			June ...	20·2	21·6	19·4	20·5
			Sept.	19·5	21·2	18·5	22·4
			Dec.	21·7	23·0	20·5	20·8
			Year ...	21·2	22·7	20·3	21·9
In the remaining Dis- tricts and Sub-districts of England and Wales, comprising chiefly Small Towns and Country Parishes	34,134,802	10,523,478	Year ..	17·3	18·7	16·8	18·5
			March ..	19·1	21·5	19·6	21·0
			June ...	17·2	19·1	17·4	18·2
			Sept.	15·2	16·3	14·2	17·2
			Dec.	17·5	18·0	15·9	17·6

Note.—In calculating these rates of mortality corrections are made for inequalities in the numbers of days in the different quarters of the year. The annual rates are the means of the four quarterly rates.

D.—*Special Town Table:—POPULATION ; BIRTH-RATE and DEATH-RATE in each Quarter of 1882, in TWENTY-EIGHT Large Towns.*

Cities and Boroughs.	Estimated Population in the Middle of the Year 1882.	Annual Rate to 1,000 Living during the Thirteen Weeks ending							
		1st April. (1st Quarter.)		1st July. (2nd Quarter.)		30th September. (3rd Quarter.)		30th December. (4th Quarter.)	
		Births.	Deaths.	Births.	Deaths.	Births.	Deaths.	Births.	Deaths.
Twenty-eight towns.....	8,469,751	36·7	24·7	35·1	20·9	34·7	20·6	38·8	22·9
London	3,893,272	36·2	25·6	33·3	19·5	33·6	18·6	34·2	21·8
Brighton	109,595	32·5	29·2	30·0	21·8	31·0	17·8	29·1	18·1
Portsmouth	129,916	35·2	21·2	34·6	24·3	32·8	19·5	33·4	20·9
Norwich	88,821	36·5	23·9	32·4	19·0	33·4	18·4	33·3	21·0
Plymouth	74,449	33·5	24·4	32·9	20·1	30·7	18·6	31·4	21·7
Bristol	210,134	34·9	21·6	33·3	19·9	32·7	16·4	31·3	19·0
Wolverhampton	76,756	36·6	25·4	37·2	22·6	35·9	21·0	34·8	20·5
Birmingham	408,532	39·0	21·4	37·0	19·5	34·3	21·0	35·9	21·9
Leicester	126,275	39·8	19·3	38·7	18·7	38·5	23·4	37·3	19·1
Nottingham	193,573	39·4	25·9	38·2	22·6	38·7	23·6	36·2	22·3
Derby	83,587	30·7	20·6	35·0	18·6	33·4	14·9	39·9	20·7
Birkenhead	86,582	34·5	20·4	37·8	18·4	35·7	19·7	38·4	21·9
Liverpool	560,377	36·7	26·5	37·6	25·2	36·5	25·1	36·0	29·3
Bolton	106,767	40·4	25·9	36·5	25·3	34·0	21·1	34·7	19·4
Manchester	340,211	38·5	27·6	37·2	27·9	36·0	25·0	35·2	26·4
Salford	184,004	40·6	24·3	39·8	23·1	37·2	24·3	37·9	21·2
Oldham	115,572	34·0	26·7	35·6	24·1	35·8	21·8	34·2	26·0
Blackburn	106,460	38·8	28·9	39·9	24·2	38·7	22·6	36·5	24·7
Preston	97,656	41·5	28·7	41·1	26·8	37·8	25·7	38·4	29·1
Huddersfield	83,418	31·8	22·3	29·4	20·8	32·7	23·1	29·3	23·2
Halifax	74,713	28·3	20·0	29·7	19·0	31·2	18·6	30·8	23·9
Bradford	200,158	32·5	21·9	31·2	22·1	32·5	20·1	31·3	20·7
Leeds	315,998	36·6	22·4	37·6	21·1	35·2	22·9	35·0	26·5
Sheffield	290,516	38·1	22·9	38·0	19·8	36·7	21·1	36·8	23·0
Hull	158,814	35·6	21·4	37·4	20·9	35·3	25·6	38·1	24·9
Sunderland	119,065	41·8	23·1	42·8	22·2	40·4	28·3	39·8	32·5
Newcastle	147,626	36·6	22·9	36·1	21·1	39·0	24·5	37·1	24·0
Cardiff	86,724	41·2	20·9	38·1	16·3	39·2	18·7	38·6	23·8
Edinburgh	232,440	31·2	20·0	35·0	20·5	29·0	17·8	30·8	20·5
Glasgow	514,048	39·0	25·3	40·7	25·7	37·0	22·5	37·0	28·3
Dublin	348,293	30·7	35·1	30·7	26·8	28·0	23·1	26·6	26·7

E.—*Divisional Table:—MARRIAGES in the Year ending 30th September; and BIRTHS and DEATHS in the Year ending 31st December, 1882, as Registered Quarterly.*

1 DIVISIONS. (England and Wales.)	2 AREA* in Statute Acres.	3 Enumerated POPULATION, 1881 (Unrevised).	4 5 6 7 MARRIAGES in Quarters ending			
			31st December, 1881.	31st March, 1882.	30th June, 1882.	30th September, 1882.
		No.	No.	No.	No.	No.
ENGLD. & WALES....Totals	37,319,221	25,968,286	60,204	39,791	52,766	50,989
I. London	75,362	3,814,571	10,033	6,647	9,135	9,594
II. South-Eastern	3,994,431	2,486,151	5,364	3,222	4,345	4,311
III. South Midland	3,201,325	1,596,041	3,334	1,691	2,637	2,535
IV. Eastern	3,211,441	1,324,923	3,385	1,592	2,000	2,055
V. South-Western	4,981,170	1,858,446	3,664	2,680	3,424	2,892
VI. West Midland	3,945,460	3,029,362	6,940	4,338	6,183	5,624
VII. North Midland	3,535,445	1,637,624	3,740	2,270	3,631	2,983
VIII. North-Western	1,998,914	4,107,155	9,406	7,277	9,131	9,210
IX. Yorkshire	3,702,384	2,894,527	6,977	4,578	5,687	5,739
X. Northern	3,547,947	1,624,468	3,837	3,075	3,640	3,305
XI. Monmthsh. & Wales	5,125,342	1,577,018	3,524	2,421	2,953	2,741

8 DIVISIONS. (England and Wales.)	9 10 11 12 BIRTHS in each Quarter of 1882 ending				13 14 15 16 DEATHS in each Quarter of 1882 ending			
	31st March.	30th June.	30th Septem- ber.	31st Decem- ber.	31st March.	30th June.	30th Septem- ber.	31st Decem- ber.
	No.	No.	No.	No.	No.	No.	No.	No.
ENGLD. & WALES....Totals	223,802	227,429	220,118	217,591	140,324	125,078	118,114	133,267
I. London	35,079	32,345	32,604	33,172	24,806	18,896	18,053	21,150
II. South-Eastern	20,048	19,527	19,376	19,404	12,198	10,458	9,543	10,795
III. South Midland	12,846	13,288	12,716	12,496	7,931	6,646	6,192	7,157
IV. Eastern	11,446	11,307	11,007	11,028	6,777	5,864	5,441	6,161
V. South-Western	13,840	14,329	13,847	13,609	9,078	8,013	6,891	8,228
VI. West Midland	26,322	26,909	25,307	25,559	15,230	13,994	12,958	15,154
VII. North Midland	14,447	14,730	14,264	13,967	8,218	7,621	7,431	8,079
VIII. North-Western	37,664	38,520	37,260	36,224	24,552	23,133	21,989	24,171
IX. Yorkshire	24,467	26,065	25,039	24,780	15,059	14,481	14,584	15,802
X. Northern	14,714	16,170	15,412	15,090	8,075	8,393	8,680	8,904
XI. Monmthsh. & Wales	12,929	14,239	13,286	12,262	8,400	7,579	6,352	7,666

* These are revised figures, and will be found to differ somewhat from those first published.

F.—General Meteorological Table,

[Abstracted from the particulars supplied to the

1882. Months.	Temperature of										Elastic Force of Vapour.		Weight of Vapour in a Cubic Foot of Air.	
	Air.			Evaporation.		Dew Point.		Air—Daily Range.		Water of the Thames	Mean.	Diff. from Average of 41 Years.	Mean.	Diff. from Average of 41 Years.
	Mean.	Diff. from Average of 111 Years.	Diff. from Average of 41 Years.	Mean.	Diff. from Average of 41 Years.	Mean.	Diff. from Average of 41 Years.	Mean.	Diff. from Average of 41 Years.					
Jan.	40·4	+3·9	+2·1	39·0	+2·2	37·2	+2·5	9·1	-0·5	—	ln. ·222	+·024	Gr. 2·6	+0·3
Feb.	41·8	+3·1	+2·4	40·5	+2·8	38·8	+3·1	11·5	+0·4	—	·238	+·031	2·8	+0·5
Mar. ...	46·0	+4·9	+4·3	43·5	+4·2	40·7	+4·6	17·5	+2·9	—	·256	+·041	3·0	+0·5
Means...	42·7	+4·0	+2·9	41·0	+3·1	38·9	+3·4	12·7	+0·9	—	·239	+·032	2·8	+0·4
April ...	47·9	+1·8	+0·8	45·3	+1·4	42·4	+1·9	17·8	-0·6	—	·271	+·018	3·1	+0·2
May.....	54·5	+2·0	+1·9	50·5	+1·7	46·6	+1·6	22·0	+1·6	—	·318	+·020	3·6	+0·1
June ...	56·5	-1·7	-2·4	53·3	-1·2	50·4	-0·2	17·4	-3·7	—	·366	+·004	4·1	0·0
Means...	53·0	+0·7	+0·1	49·7	+0·6	45·5	+1·1	19·1	-0·9	—	·318	+·014	3·6	+0·1
July.....	60·4	-1·2	-1·8	56·6	-1·2	53·2	-0·8	18·6	-2·4	—	·406	-·013	4·5	-0·3
Aug. ...	59·6	-1·3	-1·9	56·3	-1·2	53·4	-0·6	18·8	-0·9	—	·409	-·011	4·6	-0·1
Sept. ...	54·3	-2·2	-2·8	52·0	-2·0	49·8	-1·3	17·4	-0·9	—	·358	-·022	4·0	-0·4
Means...	58·1	-1·6	-2·2	55·0	-1·5	52·1	-0·9	18·3	-1·4	—	·391	-·019	4·4	-0·3
Oct.	50·8	+1·3	+0·8	49·2	+1·2	47·5	+1·6	12·9	-1·8	—	·330	+·019	3·8	+0·1
Nov. ...	43·5	+1·2	0·0	41·2	-0·1	38·6	-0·8	10·3	-1·2	—	·234	-·012	2·7	-0·1
Dec. ...	40·1	+1·0	+0·2	39·0	+0·5	37·6	+1·0	8·4	-1·0	—	·225	+·006	2·6	0·0
Means...	44·8	+1·2	+0·3	43·1	+0·5	41·2	+0·5	10·5	-1·3	—	·263	+·004	3·0	0·0

Note.—In reading this table it will be borne in mind that the sign (—) minus signifies

The mean temperature of the air for October was 50°·8, being 1°·3 and 0°·8 above the average of 111 years and 41 years respectively; it was 5°·5 and 4°·6 higher than in 1881 and 1880 respectively.

The mean temperature of the air for November was 43°·5, being 1°·2 above the average of 111 years and the same as the average of 41 years; it was 5°·2 lower than in 1881, and 1°·0 higher than in 1880.

The mean temperature of the air for December was 40°·1, being 1°·0 and 0°·2 above the averages of 111 years and 41 years respectively; it was 0°·3 higher than in 1881, and 3°·1 lower than in 1880.

The mean temperature for the quarter was 44°·8, being 1°·2 above the average of 111 years and 0°·3 above the average of 41 years.

for the Year ended 31st December, 1882.

Registrar-General by JAMES GLAISHER, ESQ., F.R.S., &c.]

Degree of Humidity.		Reading of Barometer.		Weight of a Cubic Foot of Air.		Rain.		Daily Horizontal Movement of the Air.	Reading of Thermometer on Grass.					1882. Months.
Mean.	Diff. from Average of 41 Years	Mean.	Diff. from Average of 41 Years	Mean.	Diff. from Average of 41 Years	Annu.	Diff. from Average of 66 Years		Number of Nights it was			Lowest Reading at Night.	Highest Reading at Night.	
								At or below 30°.	Between 30° and 40°.	Above 40°.				
89	+ 2	30·185	+·419	Grs. 559	Grs. + 5	1·35	-0·55	Miles. 265	11	20	0	18·3	37·4	January
90	+ 5	30·051	+·268	555	+ 2	1·14	-0·43	292	15	10	3	16·3	43·5	Feb.
83	+ 1	29·843	+·097	547	- 3	1·14	-0·43	349	16	10	5	19·0	46·6	March
87	+ 3	30·026	+·261	554	+ 1	Sum 3·63	Sum -1·41	Mean 302	Sum 42	Sum 40	Sum 5	Lowest 16·3	Highest 46·6	Means
83	+ 5	29·602	-·152	540	- 3	2·40	+0·65	354	11	16	3	24·1	41·5	April
75	0	29·875	+·086	538	- 3	1·37	-0·71	267	7	12	12	23·7	47·2	May
80	+ 6	29·735	-·071	533	+ 1	2·36	+0·36	325	0	5	25	33·0	53·2	June
79	+ 4	29·737	-·046	537	- 2	Sum 6·13	Sum +0·36	Mean 315	Sum 15	Sum 33	Sum 40	Lowest 23·7	Highest 53·2	Means
78	+ 3	29·700	-·099	528	0	2·45	-0·11	293	0	1	30	36·9	54·9	July
80	+ 3	29·740	-·042	529	+ 1	1·16	-1·29	303	0	7	24	33·0	55·8	August
85	+ 4	29·687	-·117	534	+ 1	2·40	-0·01	228	1	21	8	29·0	52·1	Sept.
81	+ 3	29·709	-·086	530	+ 1	Sum 6·01	Sum -1·41	Mean 324	Sum 1	Sum 29	Sum 62	Lowest 29·0	Highest 55·8	Means
88	+ 2	29·656	-·053	538	- 2	5·42	+2·62	269	3	14	14	27·0	54·2	October
86	- 2	29·532	-·217	544	- 4	2·19	-0·15	449	13	10	7	18·2	47·1	Nov.
91	+ 3	29·493	-·302	547	- 5	1·78	-0·22	258	14	10	7	20·3	48·1	Dec.
88	+ 1	29·560	-·191	543	- 4	Sum 9·39	Sum +2·25	Mean 335	Sum 30	Sum 34	Sum 28	Lowest 18·2	Highest 54·2	Means

below the average, and that the sign (+) plus signifies above the average.

The mean high day temperature of the air in October was 57°·7, being 0°·4 below the average of 41 years; in November it was 48°·7, being 0°·2 lower than the average, and in December was 44°·0, being 0°·7 lower than the average. Therefore the high day temperature was low throughout the quarter.

The mean low night temperature of the air in October was 44°·7, being 1°·3 above the average of 41 years; in November it was 38°·4, being 1°·1 above the average, and in December was 35°·6, being 0°·4 above the average throughout the quarter; therefore the low night temperature was high throughout the quarter.

The mean daily range of temperature in October was 1°·8 smaller than the average, and in November was 1°·2 below the average, and in December it was 1°·0 below the average.

No. II.—SCOTLAND.

BIRTHS, DEATHS, AND MARRIAGES, IN THE YEAR

ENDED 31ST DECEMBER, 1882.

I.—Serial Table :—Number of BIRTHS, DEATHS, and MARRIAGES in Scotland, and their Proportion to the Population estimated to the Middle of each Year, during each Quarter of the Years 1882-78 inclusive.

	1882.		1881.		1880.		1879.		1878.	
	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.
1st Quarter—										
Births	31,206	3'30	30,860	3'33	31,319	3'42	31,268	3'45	31,226	3'48
Deaths	18,265	1'93	21,284	2'30	20,751	2'27	21,950	2'42	20,320	2'26
Marriages ..	6,589	0'70	6,483	0'70	6,006	0'66	5,828	0'64	6,068	0'68
Mean Temperature }	42°·2		33°·2		39°·9		34°·2		39°·9	
2nd Quarter—										
Births	33,316	3'52	33,351	3'56	33,827	3'70	32,968	3'64	33,629	3'74
Deaths	18,293	1'93	17,889	1'91	19,711	2'15	18,784	2'04	19,514	2'17
Marriages ..	6,609	0'69	6,208	0'66	6,224	0'66	6,050	0'67	6,095	0'68
Mean Temperature }	48°·8		48°·5		49°·5		46°·8		50°·4	
3rd Quarter—										
Births	30,718	3'25	31,158	3'33	30,179	3'30	31,436	3'47	31,236	3'48
Deaths	16,886	1'78	15,602	1'67	17,047	1'86	15,115	1'67	17,314	1'93
Marriages ..	5,957	0'63	5,787	0'62	5,500	0'60	5,061	0'56	5,508	0'61
Mean Temperature }	55°·5		54°·2		57°·1		54°·1		57°·5	
4th Quarter—										
Births	30,912	3'27	30,845	3'29	29,327	3'20	30,064	3'32	30,616	3'41
Deaths	19,522	2'06	17,526	1'87	18,286	2'00	17,480	1'93	19,597	2'18
Marriages ..	7,419	0'78	7,470	0'80	6,759	0'74	6,523	0'72	6,662	0'74
Mean Temperature }	40°·2		42°·7		39°·2		40°·4		39°·2	
Year—										
Population.	3,785,400		3,744,685		3,661,292		3,627,453		3,593,929	
Births	126,182	3'33	126,214	3'37	124,652	3'40	125,736	3'46	126,707	3'53
Deaths	72,966	1'93	72,301	1'93	75,795	2'07	73,329	2'02	76,775	2'14
Marriages ..	26,574	0'70	25,948	0'69	24,489	0'67	23,462	0'65	24,333	0'68

I.—*Special Average Table:—Number of Births, Deaths, and Marriages in Scotland and in the Town and Country Districts for each Quarter of the Year ending 31st December, 1882, and their Proportion to the Population; also the Number of Illegitimate Births, and their Proportion to the Total Births.*

Registration Groups of Districts.	Total Births.			Illegitimate Births.			Deaths.			Marriages.		
	Number	Per Cent.	Ratio. One in every	Number	Per Cent.	Ratio. One in every	Number.	Per Cent.	Ratio. One in every	Number.	Per Cent.	Ratio. One in every
1st Quarter—												
SCOTLAND	31,206	3'30	30	2,715	8'7	11'5	18,265	1'93	52	6,589	0'70	144
Principal towns	10,874	3'57	28	870	8'0	12'5	6,849	2'24	45	2,779	0'91	110
Large „	5,533	3'75	27	391	7'1	14'2	3,055	2'07	48	1,275	0'86	116
Small „	6,712	3'24	31	592	8'8	11'3	3,817	1'84	54	1,204	0'58	172
Mainland rural	7,286	2'87	35	805	11'0	9'1	3,995	1'57	64	1,133	0'45	224
Insular „	801	2'46	41	57	7'1	14'1	549	1'69	59	198	0'61	164
2nd Quarter—												
SCOTLAND	33,346	3'52	28	2,635	7'9	12'6	18,293	1'93	51'7	6,609	0'69	143
Principal towns	11,612	3'81	26	905	7'8	12'8	6,959	2'28	43	2,649	0'86	115
Large „	5,738	3'88	25	380	6'6	15'1	3,015	2'04	49	1,130	0'76	130
Small „	7,429	3'53	28	563	7'5	13'2	3,966	1'88	52	1,253	0'59	167
Mainland rural	7,830	3'11	32	739	9'4	10'5	3,847	1'53	65	1,488	0'59	169
Insular „	737	2'26	44	48	6'5	15'3	506	1'55	64	89	0'27	365
3rd Quarter—												
SCOTLAND	30,718	3'25	31	2,607	8'5	11'8	16,886	1'78	56	5,957	0'63	159
Principal towns	10,411	3'41	29	814	7'8	12'8	6,332	2'08	48	2,570	0'84	119
Large „	5,619	3'63	28	356	6'3	15'8	3,066	1'98	51	1,141	0'74	136
Small „	6,657	3'30	30	595	8'9	11'2	3,588	1'78	56	1,173	0'58	172
Mainland rural	7,234	2'87	35	794	11'0	9'1	3,443	1'37	73	1,014	0'40	249
Insular „	797	2'45	41	48	6'0	16'6	457	1'40	71	59	0'18	552
4th Quarter—												
SCOTLAND	30,912	3'27	31	2,602	8'4	11'8	19,522	2'06	48	7,419	0'78	127
Principal towns	10,652	3'49	28	905	8'5	11'7	7,619	2'50	40	2,755	0'90	111
Large „	5,642	3'64	27	328	5'8	17'2	3,495	2'25	44	1,108	0'72	139
Small „	6,561	3'25	31	524	8'0	12'5	3,877	1'92	52	1,523	0'75	133
Mainland rural	7,186	2'85	35	811	11'3	8'8	4,029	1'60	62	1,835	0'72	138
Insular „	871	2'68	37	34	3'9	25'9	502	1'54	65	198	0'61	164

Population of Scotland.

Population.	Scotland.	Principal Towns.	Large Towns.	Small Towns.	Mainland Rural.	Insular Rural.
By Census of 1881	3,735,573	1,203,139	570,660	816,184	1,015,202	130,388
Estimated to the middle of 1882	3,785,400	1,219,586	590,845	828,717	1,016,065	130,187

III.—*Bastardy Table:—Proportion of ILLEGITIMATE in every Hundred BIRTHS in the Divisions and Counties of SCOTLAND, during each quarter of the Year ending 31st December, 1882; with the Corresponding Figures for 1881 added for Comparison.*

Divisions and Counties.	Per Cent. for the Quarters ending 1882.				Per Cent. for the Quarters ending 1881.			
	31st March.	30th June.	30th Sept.	31st Dec.	31st March.	30th June.	30th Sept.	31st Dec.
SCOTLAND	8·7	7·9	8·5	8·4	8·5	7·9	8·51	8·3
<i>Divisions—</i>								
Northern	9·5	8·2	7·9	7·0	10·0	6·6	6·6	6·8
North-Western	6·0	6·9	6·5	5·6	7·0	6·5	5·2	6·3
North-Eastern	15·1	13·2	14·9	14·0	14·0	11·8	14·6	14·8
East Midland	9·0	8·1	8·8	9·1	8·4	9·2	9·4	7·6
West Midland	7·3	6·0	7·7	6·1	7·3	6·2	6·5	6·4
South-Western	7·1	6·4	6·7	6·8	6·8	6·5	7·1	7·1
South-Eastern	7·5	7·6	7·1	8·1	7·8	7·7	7·3	7·6
Southern	14·6	11·9	15·0	15·1	14·9	11·5	13·7	12·8
<i>Counties—</i>								
Shetland	4·6	6·2	5·9	2·1	4·8	4·9	4·9	4·8
Orkney	10·6	5·2	6·6	8·1	5·6	5·0	3·7	5·4
Caithness	10·7	11·4	12·0	9·2	14·7	9·7	9·1	10·0
Sutherland	10·6	7·8	3·9	7·3	11·8	3·7	7·9	5·8
Ross and Cromarty	5·0	5·6	4·9	4·6	4·2	4·7	3·3	4·8
Inverness	6·9	7·7	8·1	6·6	9·8	8·0	7·1	7·9
Nairn	3·6	6·8	13·1	15·1	16·7	9·9	15·0	7·3
Elgin	15·1	11·7	17·9	12·9	18·3	11·6	15·0	18·8
Banff	19·1	14·1	15·8	17·8	15·0	14·1	18·8	15·6
Aberdeen	15·1	13·8	14·9	13·4	13·0	11·5	13·8	14·2
Kincardine	10·6	10·2	9·5	11·5	14·4	11·2	13·3	14·7
Forfar	10·3	9·4	9·9	10·6	9·8	10·6	10·9	8·3
Perth	8·8	7·5	10·1	9·8	7·5	7·9	10·1	8·3
Fife	7·3	6·3	6·8	6·9	6·8	6·9	6·8	6·1
Kinross	4·5	6·9	9·5	5·0	8·3	11·8	12·0	9·8
Clackmannan	7·3	10·2	5·9	3·7	8·2	15·1	5·0	7·6
Stirling	8·1	5·4	8·1	4·7	7·8	6·7	5·6	6·4
Dumbarton	6·5	5·8	7·4	8·1	4·0	4·2	6·7	5·8
Argyll	6·6	7·9	8·0	5·7	9·1	7·7	7·8	7·3
Bute	7·9	4·3	5·8	6·6	15·0	5·9	5·6	6·0
Renfrew	6·2	5·9	5·9	5·7	4·7	6·0	6·2	5·8
Ayr	9·4	7·2	8·5	6·6	7·7	7·6	7·7	8·3
Lanark	6·9	6·3	6·5	7·0	7·1	6·4	7·2	7·2
Linlithgow	7·5	5·6	6·9	6·8	7·9	7·7	7·9	6·6
Edinburgh	7·1	7·8	6·8	7·9	7·3	8·0	7·1	7·6
Haddington	7·0	6·8	7·7	8·4	9·3	5·9	7·9	6·6
Berwick	13·8	11·3	11·6	9·4	13·7	7·6	10·0	11·8
Peebles	13·0	6·9	5·9	8·4	11·6	9·3	5·0	6·6
Selkirk	4·7	5·7	5·4	10·8	4·4	5·2	7·1	7·3
Roxburgh	10·5	9·1	10·6	10·2	11·4	8·2	10·0	11·4
Dumfries	15·6	12·5	16·1	17·9	16·5	14·4	14·4	14·1
Kirkeudbright	14·9	10·8	16·1	18·8	14·9	11·1	13·8	8·5
Wigtown	17·8	15·7	17·8	13·7	16·8	10·2	17·4	17·0

IV.—*Divisional Table:—MARRIAGES, BIRTHS, and DEATHS Registered in the Year ended 31st December, 1882.*

(Compiled from the Registrar-General's Quarterly Returns.)

1	2	3	4	5	6
DIVISIONS. (Scotland)	AREA in Statute Acres.	POPULATION, 1881. (Persons.)	Marriages.	Births.	Deaths.
		No.	No.	No.	No.
SCOTLAND Totals	19,639,377	3,735,573	26,574	126,182	72,966
I. Northern	2,261,622	123,984	574	3,027	1,913
II. North-Western	4,739,876	165,856	760	4,303	2,632
III. North-Eastern	2,429,594	418,250	2,609	13,701	6,954
IV. East Midland	2,790,492	602,421	3,929	18,367	11,029
V. West Midland	2,693,176	283,460	1,743	8,979	5,285
VI. South-Western	1,462,397	1,385,447	11,800	53,525	31,244
VII. South-Eastern	1,192,524	546,658	4,002	18,078	10,207
VIII. Southern	2,069,696	209,497	1,157	6,202	3,702

No. III.—GREAT BRITAIN AND IRELAND.

SUMMARY of MARRIAGES, in the Year ended 30th September, 1882; and of BIRTHS and DEATHS, in the Year ended 31st December, 1882.

(Compiled from the Quarterly Returns of the respective Registrars-General.)

COUNTRIES.	[000's omitted.]		Marriages.	Per 1,000 of Popu- lation.	Births.	Per 1,000 of Popu- lation.	Deaths.	Per 1,000 of Popu- lation.
	Area in Statute Acres.	Popu- lation, 1881.* (Persons.)						
England and Wales	37,319	No. 25,968	No. 203,750	Ratio. 7·7	No. 888,940	Ratio. 34·2	No. 516,783	Ratio. 19·9
Scotland	19,639	3,734	26,625	7·1	126,182	33·7	72,966	19·5
Ireland	20,323	5,160	22,225	4·3	122,715	23·7	88,737	17·1
GREAT BRITAIN AND IRELAND }	77,281	34,862	242,600	6·9	1,137,837	32·5	678,486	19·4

* By preliminary Report of Census of 1881, and therefore subject to revision.

Note.—The numbers against Ireland represent the marriages, births, and deaths that the local registrars have *succeeded* in recording; but how far the registration approximates to absolute completeness, does not at present appear to be known. It will be seen that the Irish ratios of marriages, births, and deaths are much under those of England and Scotland.—ED. S. J.

Trade of United Kingdom, for the Years 1881-77.—*Declared Value of the Total Exports of Foreign and Colonial Produce and Manufactures to each Foreign Country and British Possession.*

Merchandise Exported to the following Foreign Countries, &c.	[000's omitted.]				
	1881.	1880.	1879.	1878.	1877.
I.—FOREIGN COUNTRIES.	£	£	£	£	£
Northern Europe; viz., Russia, Sweden, Norway, Denmark, & Iceland, & Heligoland } Central Europe; viz., Germany, Holland and Belgium } Western Europe; viz., France, Portugal, (with Azores, Madeira, &c.), and Spain, (with Gibraltar and Canaries) } Southern Europe; viz., Italy, Austrian Empire, Greece, Ionian Islands, and Malta } Levant; viz., Turkey, Roumania,* Syria and Palestine, and Egypt } Northern Africa; viz., Tripoli, Tunis, Algeria, and Morocco } Western Africa } Eastern Africa; with African Ports on Red Sea, Aden, Arabia, Persia, Bourbon, and Kooria Moorla Islands } Indian Seas, Siam, Sumatra, Java, Philip-pines; other Islands } South Sea Islands } China, including Hong Kong and Japan } United States of America } Mexico and Central America } Foreign West Indies and Hayti } South America (Northern), New Granada, Venezuela and Ecuador } " (Pacific), Peru, Bolivia, Chili, and Patagonia } " (Atlantic), Brazil, Uruguay, and Argentine Confed. } Other countries (unenumerated)	5,218, 24,702, 15,102, 1,426, 786, 56, 186, — — 782, 6,987, 104, 15, 63, 302, 355, 121,	5,416, 25,732, 13,895, 1,418, 675, 62, 219, — 851, — 1,163, 7,098, 80, 15, 58, 313, 358, 159,	4,742, 23,913, 13,061, 1,616, 662, 74, 221, — 29, — 1,030, 5,197, 98, 686, 37, 260, 420, 108,	4,799, 20,715, 12,973, 1,766, 737, 178, 257, — 328, — 382, 2,980, 121, 689, 37, 323, 755, 109,	4,587, 22,182, 12,789, 1,773, 474, 77, 299, — 307, — 344, 3,509, 119, 497, 33, 264, 593, 150,
<i>Total—Foreign Countries.....</i>	56,205,	57,512,	52,172,	47,329,	47,997,
II.—BRITISH POSSESSIONS:					
British India, Ceylon, and Singapore } Austral. Cols.—New South Wales and Victoria, So. Aus., W. Aus., Tasm., and N. Zealand } British North America } " W. Indies with Btsh. Guiana & Honduras } Cape and Natal } Brt. W. Co. of Af., Ascension and St. Helena } Mauritius } Channel Islands } Other possessions }	2,031, 2,604, 897, 342, 619, 69, 43, 204, 46,	1,627, 1,817, 807, 407, 576, 101, 28, 232, 247,	1,540, 1,689, 674, 291, 517, 102, 25, 214, 27,	1,536, 1,952, 597, 306, 546, 99, 22, 198, 50,	1,475, 2,218, 642, 328, 387, 82, 106, 184, 34,
<i>Total—British Possessions</i>	6,855,	5,842,	5,080,	5,306,	5,456,
General Total	£ 63,060,	63,354,	57,272,	52,635,	53,453,

* Wallachia and Moldavia to 1878, and Roumania in 1879.

Trade of United Kingdom, 1882-81-80.—Distribution of Exports* from United Kingdom, according to their Declared Real Value; and the Declared Real Value (Ex-duty) of Imports at Port of Entry, and therefore including Freight and Importer's Profit.

Merchandise (excluding Gold and Silver) Imported from, and Exported to, the following Foreign Countries, &c.	[000's omitted.]					
	1882.		1881.		1880.	
	Imports from	Exports to	Imports from	Exports to	Imports from	Exports to
I.—FOREIGN COUNTRIES:	£	£	£	£	£	£
Northern Europe; viz., Russia, Sweden, Norway, Denmark & Iceland, & Heligoland	38,061,	11,585,	27,700,	11,566,	32,289,	13,044,
Central Europe; viz., Germany, Holland, and Belgium	65,474,	36,136,	57,916,	33,275,	61,513,	31,841,
Western Europe; viz., France, Portugal (with Azores, Madeira, &c.), and Spain (with Gibraltar and Canaries)	54,771,	24,030,	53,963,	23,812,	57,032,	21,036,
Southern Europe; viz., Italy, Austrian Empire, Greece, Roumania, and Malta	12,561,	10,226,	9,860,	10,887,	7,963,	8,791,
Levant; viz., Turkey, Asiatic and European (including Cyprus), and Egypt	12,504,	8,880,	13,299,	10,059,	12,927,	9,827,
Northern Africa; viz., Tripoli, Tunis, Algeria and Morocco	1,406,	714,	1,527,	646,	1,589,	607,
Western Africa	1,713,	1,227,	1,583,	1,125,	1,896,	991,
Eastern Africa; with African Ports on Red Sea, Aden, Arabia, Persia, Bourbon, and Kooria Moorla Islands	821,	596,	728,	605,	714,	629,
Indian Seas, Siam, Sumatra, Java, Philippines; other Islands	6,052,	3,369,	5,057,	3,263,	4,384,	3,075,
South Sea Islands	114,	101,	43,	130,	122,	84,
China and Japan, including Hong Kong	12,110,	9,761,	12,426,	12,421,	13,585,	12,138,
United States of America	87,855,	30,999,	102,880,	29,788,	106,947,	30,877,
Mexico and Central America	2,131,	2,600,	1,913,	2,543,	1,942,	1,881,
Foreign West Indies, Hayti, &c.	2,091,	3,070,	1,787,	3,140,	2,129,	2,637,
South America (Northern), New Granada, Venezuela, and Ecuador	1,607,	1,718,	1,891,	1,921,	1,685,	1,825,
" (Pacific), Peru, Bolivia, Chili, and Patagonia	6,494,	4,075,	5,222,	3,426,	6,409,	2,313,
" (Atlantic) Brazil, Uruguay, and Argentine Republic	8,544,	12,484,	7,348,	11,391,	6,869,	10,497,
Whale Fisheries; Grnld., Davis' Straits, Southn. Whale Fishery, Falkland Islands, and French Possessions in North America	214,	85,	165,	24,	216,	25,
<i>Total—Foreign Countries</i>	314,523,	161,656,	305,308,	160,022,	320,211,	153,018,
II.—BRITISH POSSESSIONS:						
British India, Ceylon, and Singapore	46,944,	32,027,	38,603,	32,632,	37,371,	33,722,
Austral. Cols.—N. So. W., Victoria & Queensld.	16,710,	17,309,	17,860,	14,806,	15,934,	11,149,
" " So. Aus., W. Aus., Tasm., N. Zealand, & Fiji Islands	8,449,	8,047,	9,130,	6,530,	9,731,	5,797,
British North America	10,307,	9,703,	11,226,	8,406,	13,214,	7,698,
" W. Indies with Btsh. Guiana & Honduras	6,780,	3,328,	5,907,	2,723,	6,750,	3,042,
Cape and Natal	6,263,	7,525,	5,406,	7,071,	5,643,	6,629,
Port. W. Co. of Af., Ascension and St. Helena	626,	817,	520,	663,	804,	819,
St. Mauritius	449,	495,	450,	443,	288,	358,
Channel Islands	847,	570,	757,	643,	817,	585,
<i>Total—British Possessions</i>	97,375,	79,821,	89,859,	73,917,	90,560,	69,783,
<i>General Total</i>	£ 411,898,	£ 241,477,	£ 395,167,	£ 233,939,	£ 410,771,	£ 222,801,

* i.e., British and Irish produce and manufactures.

IMPORTS.—(United Kingdom).—For the Years 1882-81-80-79-78.--Declared Real Value (*Ex-duty*), at Port of Entry (and therefore including Freight and Importer's profit), of Articles of Foreign and Colonial Merchandise Imported into the United Kingdom.

[000's omitted.]

FOREIGN ARTICLES IMPORTED.		1882.	1881.	1880.	1879.	1878.
		£	£	£	£	£
RAW MATLS.— <i>Textile</i> , &c.	Cotton, Raw ...	46,193,	43,502,	42,765,	36,279,	33,524,
	Wool	27,207,	27,499,	28,356,	24,930,	24,589,
	Silk*	14,905,	15,066,	17,461,	16,825,	16,867,
	Flax	3,608,	3,398,	4,070,	3,581,	3,483,
	Hemp and Jute	6,501,	6,159,	5,894,	4,943,	5,156,
	Indigo	2,610,	2,346,	1,698,	1,901,	1,583,
		101,024,	97,970,	100,244,	88,459,	85,202,
" " <i>Various</i> .	Hides	3,741,	6,355,	6,911,	5,109,	6,266,
	Oils	2,900,	3,359,	3,418,	3,477,	3,184,
	Metals	14,392,	12,448,	15,794,	10,619,	10,632,
	Tallow	2,256,	2,102,	2,310,	2,100,	1,811,
	Timber	17,168,	14,957,	16,583,	10,726,	13,915,
		40,457,	39,221,	46,016,	32,031,	35,808,
" " <i>Agrcultl.</i>	Guano	390,	489,	805,	704,	1,805,
	Seeds	8,608,	7,563,	7,597,	7,098,	8,690,
		8,998,	8,052,	8,402,	7,802,	10,495,
TROPICAL, &c., PRODUCE.	Tea	11,363,	11,345,	11,752,	11,373,	13,097,
	Coffee and Chich.	5,288,	5,267,	7,062,	7,324,	6,093,
	Sugar & Molasses	24,976,	24,404,	22,970,	22,351,	21,107,
	Tobacco	2,563,	2,623,	2,901,	1,975,	3,718,
	Rice	3,297,	3,666,	3,750,	3,481,	3,192,
	Fruits	4,055,	4,125,	3,288,	3,794,	3,509,
	Wines	5,463,	5,660,	6,483,	5,380,	6,003,
	Spirits	1,875,	1,676,	1,979,	2,895,	2,209,
		58,880,	58,766,	60,185,	58,573,	58,928,
FOOD	Grain and Meal.	63,196	60,557,	62,369,	60,596,	58,373,
	Provisions	36,808,	41,296,	43,438,	35,901,	35,951,
		100,004,	101,853,	105,807,	96,497,	94,324,
Remainder of Enumerated Articles		57,766,	47,694,	48,582,	41,955,	43,253,
TOTAL ENUMERATED IMPORTS		367,129,	353,556,	368,240,	325,317,	328,010,
Add for UNENUMERATED IMPORTS (say) ..		44,872,	42,100,	41,750,	36,810,	38,050,
TOTAL IMPORTS		412,001,	395,656,	409,990,	362,127,	366,060,

* "Silk," inclusive of manufactured silk, "not made up."

EXPORTS.—(United Kingdom).—For the Years 1882-81-80-79-78.—*Declared Real Value, at Port of Shipment, of Articles of BRITISH and IRISH Produce and Manufactures Exported from the United Kingdom.*

[000's omitted.]

BRITISH PRODUCE, &c., EXPORTED.	1882.	1881.	1880.	1879.	1878.
	£	£	£	£	£
MANFRES.—Textile. Cotton Manufactures..	62,945,	65,923,	63,657,	51,843,	52,903,
„ Yarn	12,867,	13,167,	11,906,	12,103,	13,006,
Woollen Manufactures	18,789,	18,122,	17,270,	15,851,	16,723,
„ Yarn	3,399,	3,224,	3,344,	3,714,	3,910,
Silk Manufactures	2,692,	2,565,	2,029,	1,696,	1,921,
„ Yarn ..	828,	1,009,	685,	694,	564,
Linen Manufactures	5,967,	5,844,	5,826,	5,474,	5,526,
„ Yarn	1,038,	1,057,	978,	1,075,	1,213,
	108,525,	110,911,	105,695,	92,450,	95,766,
„ <i>Sewed.</i> Apparel	4,170,	3,710,	3,194,	3,198,	3,155,
Haberdry. and Millnry.	4,258,	4,190,	3,869,	3,487,	3,966,
	8,428,	7,900,	7,063,	6,685,	7,121,
METALS, &c. Hardware	4,112,	3,859,	3,512,	3,019,	3,290,
Machinery	11,963,	9,944,	9,262,	7,283,	7,490,
Iron	31,579,	27,576,	28,307,	19,439,	18,394,
Copper and Brass	3,782,	3,823,	3,638,	3,380,	3,522,
Lead and Tin	1,158,	1,139,	984,	1,019,	1,057,
Coals and Culm	9,561,	8,794,	8,379,	7,202,	7,321,
	62,125,	55,135,	54,082,	41,342,	41,074,
Ceramic Manufets. Earthenware and Glass	3,283,	3,059,	2,896,	2,526,	2,450,
Indigenous Mnfes. and Products. Beer and Ale.....	1,872,	1,725,	1,730,	1,759,	1,762,
Butter	220,	205,	201,	235,	243,
Cheese	65,	51,	51,	55,	66,
Candles	135,	138,	143,	136,	170,
Salt	570,	587,	604,	552,	503,
Spirits	756,	769,	532,	454,	390,
Soda	—	—	—	—	—
	3,618,	3,475,	3,261,	3,191,	3,134,
Various Manufets. Books, Printed	1,173,	1,101,	971,	953,	891,
Furniture	—	—	—	—	—
Leather Manufactures	2,833,	2,461,	2,096,	2,058,	2,003,
Soap	458,	397,	443,	433,	405,
Plate and Watches	352,	285,	233,	213,	221,
Stationery	882,	796,	723,	664,	647,
	5,698,	4,040,	4,466,	4,321,	4,167,
Remainder of Enumerated Articles	25,844,	25,563,	24,843,	22,936,	20,953,
Unenumerated Articles.....	23,926,	22,856,	20,505,	18,053,	18,139,
TOTAL EXPORTS.....	241,477,	233,939,	222,811,	191,504,	192,804,

SHIPPING.—(United Kingdom.)—Account of Tonnage of Vessels Entered and Cleared with Cargoes, from and to Various Countries, during the Years ended December, 1882-81-80.

Countries from whence Entered and to which Cleared.	Total British and Foreign.					
	1882.		1881.		1880.	
	Entered.	Cleared.	Entered.	Cleared.	Entered.	Cleared.
FOREIGN COUNTRIES.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Russia { Northern ports	1,572,277	1,236,101	1,200,111	1,067,482	1,465,788	1,211,278
{ Southern „	443,379	262,090	199,790	196,252	189,468	220,892
Sweden	1,357,908	896,982	1,161,035	793,600	1,318,864	797,262
Norway	930,236	564,359	862,559	524,111	854,028	484,508
Denmark.....	284,297	790,623	255,018	753,094	287,497	705,505
Germany.....	1,867,051	2,664,678	1,697,706	2,476,010	1,714,670	2,583,823
Holland	1,447,736	1,475,274	1,355,811	1,401,750	1,266,361	1,393,723
Belgium	1,083,521	1,050,429	957,530	983,520	931,278	980,183
France	2,005,471	3,818,367	1,966,635	3,525,879	1,988,202	3,502,433
Spain	2,400,816	928,619	1,869,910	840,146	1,942,041	790,114
Portugal	235,270	377,292	209,713	345,044	241,170	357,678
Italy	302,734	1,396,790	296,496	1,241,050	317,865	1,152,848
Austrian territories	59,162	71,982	36,451	66,440	32,832	81,285
Greece.....	95,908	106,646	71,761	94,571	57,731	78,470
Roumania	346,918	86,903	201,366	60,628	97,976	38,174
Turkey	206,155	251,284	195,560	245,369	159,200	264,458
Egypt	249,083	567,086	281,010	641,123	317,554	502,688
United States of America ...	4,297,362	3,434,556	5,034,323	3,796,786	5,266,642	3,727,189
Mexico, Foreign West } Indies, and Central } America	196,651	523,525	185,723	462,111	214,274	483,873
Brazil	252,782	536,331	251,718	521,584	218,493	470,695
Peru.....	106,281	68,182	62,367	50,169	92,639	38,020
Chili	127,584	263,002	117,921	302,595	126,574	210,530
China	167,097	34,127	152,059	23,345	180,816	24,570
Other countries	779,436	1,013,996	748,246	919,643	702,648	815,259
<i>Total, Foreign Countries</i>	<i>29,815,115</i>	<i>22,419,224</i>	<i>19,370,819</i>	<i>21,332,302</i>	<i>20,014,611</i>	<i>20,915,458</i>
BRITISH POSSESSIONS.						
North American Colonies	1,255,468	706,480	1,364,928	769,899	1,629,414	900,859
East Indies, including } Ceylon, Singapore, and } Mauritius	1,400,936	1,833,289	1,249,255	1,819,864	1,124,239	1,809,578
Australia and New Zealand	479,551	883,952	466,165	749,959	477,909	600,453
West Indies	164,664	195,291	158,595	190,183	177,353	176,503
Channel Islands.....	335,892	239,876	301,561	225,490	292,869	201,844
Other possessions	364,290	1,420,751	313,385	1,248,996	276,885	1,080,975
<i>Total, British Possessions</i>	<i>4,000,801</i>	<i>5,279,639</i>	<i>3,853,889</i>	<i>5,004,391</i>	<i>3,978,663</i>	<i>4,770,212</i>
TOTAL FOREIGN COUNTRIES AND BRITISH POSSESSIONS.						
Twelve Months { 1882	24,815,916	27,698,863	—	—	—	—
{ '81.....	—	—	23,224,708	26,336,693	—	—
{ '80.....	—	—	—	—	23,993,280	25,685,670

GOLD AND SILVER BULLION AND SPECIE.—(United Kingdom.)
 --Declared Real Value of, IMPORTED AND EXPORTED for the Years
 1882-81-80.

[000's omitted.]

Countries.	1882.		1881.		1880.	
	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.
Imported from—	£	£	£	£	£	£
Australia	2,997,	55,	4,470,	59,	3,614,	79,
S. America, Brazil, } Mexico, W. Indies }	739,	3,630,	846,	2,158,	853,	2,619,
United States	6,100,	1,922,	23,	2,598,	55,	1,199,
	9,836,	5,607,	5,339,	4,815,	4,522,	3,897,
France	1,832,	2,644,	2,130,	1,460,	2,118,	2,066,
Germany, Holland, } Belg., and Sweden }	1,373,	598,	1,572,	273,	1,030,	428,
Portugal, Spain, } and Gibraltar }	766,	63,	105,	33,	47,	37,
Malta and Egypt	309,	19,	415,	31,	60,	19,
China, with Hong } Kong and Japan }	6,	36,	124,	13,	1,195,	24,
West Coast of Africa	111,	51,	96,	64,	126,	63,
All other Countries	143,	226,	182,	213,	362,	295,
Totals Imported	14,376,	9,244,	9,963,	6,902,	9,459,	6,829,
Exported to—						
France	3,290,	350,	1,089,	704,	602,	173,
Germany, Holland, } Belg. & Sweden }	958,	335,	641,	965,	424,	770,
Portugal, Spain, } and Gibraltar }	1,047,	1,204,	1,063,	348,	1,021,	12,
	5,295,	1,889,	2,793,	2,017,	2,047,	955,
B. India, China, } Hong Kong and }	1,255,	6,423,	988,	4,368,	866,	5,447,
Japan						
United States	92,	29,	7,387,	31,	5,512,	34,
South Africa	6,	28,	540,	2,	—	85,
S. America, Brazil, } Mexico, W. Indies }	769,	173,	1,584,	306,	1,749,	224,
All other Countries	4,606,	423,	2,207,	280,	1,654,	315,
Totals Exported	12,023,	8,965,	15,499,	7,004,	11,829,	7,061,
Excess of imports	2,353,	279,	—	—	—	—
„ exports	—	—	5,536,	102,	2,370,	232,

BRITISH CORN.—*Gazette Average Prices (ENGLAND AND WALES)*
Weekly for 1882.

[This Table is communicated by the Commercial Department, Board of Trade.]

Weeks ended on Saturday.	Weekly Average. (Per Imperial Quarter.)			Weeks ended on Saturday.	Weekly Average. (Per Imperial Quarter.)		
	Wheat.	Barley.	Oats.		Wheat.	Barley.	Oats.
1882.	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	1882.	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
Jan. 7	44 9	31 10	20 3	July 1	46 11	25 10	23 11
„ 14	45 5	32 9	20 3	„ 8	47 7	27 4	24 —
„ 21	46 1	33 2	20 11	„ 15	48 5	26 5	25 3
„ 28	46 3	33 4	20 4	„ 22	49 2	27 8	24 6
				„ 29	50 —	27 1	25 9
Feb. 4	46 1	33 2	20 9	Aug. 5	51 3	29 1	25 3
„ 11	46 5	32 5	20 8	„ 12	50 6	26 7	22 11
„ 18	46 —	31 10	21 11	„ 19	50 5	26 1	24 5
„ 25	45 7	31 4	20 7	„ 26	47 10	30 4	24 9
March 4	44 9	30 8	21 8	Sept. 2	47 3	36 2	23 6
„ 11	44 9	30 5	21 1	„ 9	45 9	36 —	22 9
„ 18	44 7	30 —	21 —	„ 16	44 5	36 11	22 —
„ 25	44 5	30 1	21 1	„ 23	42 1	36 1	21 4
				„ 30	40 4	34 10	20 2
April 1	45 1	30 11	21 6	Oct. 7	39 6	34 4	19 10
„ 8	45 5	30 —	21 3	„ 14	39 2	34 —	19 1
„ 15	45 11	28 7	21 7	„ 21	39 7	34 5	19 9
„ 22	46 3	28 9	22 3	„ 28	40 3	34 4	19 10
„ 29	46 11	30 7	22 5				
May 6	47 2	28 5	22 8	Nov. 4	40 11	34 5	20 2
„ 13	46 11	28 9	21 8	„ 11	40 11	34 1	20 7
„ 20	47 —	27 11	23 —	„ 18	40 8	34 4	20 6
„ 27	48 1	28 4	22 7	„ 25	40 11	34 4	20 4
				Dec. 2	41 5	34 6	20 7
June 3	47 7	28 4	23 3	„ 9	41 8	34 5	20 9
„ 10	47 9	27 5	23 9	„ 16	41 6	33 8	20 9
„ 17	47 5	26 6	23 2	„ 23	41 6	33 1	22 —
„ 24	46 11	27 6	23 7	„ 30	40 11	32 8	20 5

BRITISH CORN.—*Gazette Average Prices (ENGLAND AND WALES),*
Summary of, for 1882, with those for 1881, added for Comparison.

[This Table is communicated by the Commercial Department, Board of Trade.]

Average for	Per Imperial Quarter, 1882.						Per Imperial Quarter, 1881.					
	Wheat.		Barley.		Oats.		Wheat.		Barley.		Oats.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
January.....	45	7	32	9	20	5	42	5	32	—	20	1
February	46	—	32	2	20	11	41	9	32	5	20	6
March	44	7	30	3	21	2	42	—	31	10	21	7
<i>First quarter ...</i>	45	5	31	9	20	11	42	5	32	1	20	8
April	45	11	29	9	21	9	44	6	31	11	22	1
May	47	3	28	4	22	5	44	5	31	5	22	10
June	47	5	27	7	23	7	44	6	30	5	23	4
<i>Second quarter....</i>	46	9	28	7	22	6	44	6	31	4	22	8
July	48	5	26	10	24	8	46	5	27	9	23	7
August	50	—	28	—	24	4	48	6	29	5	24	—
September.....	43	11	36	—	21	11	52	3	34	5	23	1
<i>Third quarter ...</i>	47	3	30	6	23	7	48	10	30	4	23	7
October	39	7	34	3	19	7	47	1	35	1	20	—
November	40	10	34	3	20	4	45	11	34	5	20	4
December	41	2	33	10	20	10	44	7	32	1	20	3
<i>Fourth quarter....</i>	40	8	34	—	20	4	45	10	33	10	20	2
THE YEAR	45	1	31	2	21	10	45	4	31	10	21	9

REVENUE OF THE UNITED KINGDOM.

Net Produce in QUARTERS and YEARS ended 31st DEC., 1882-81-80-79.

[000's omitted.]

QUARTERS, ended 31st Dec.	1882.	1881.	1882.		Corresponding Quarters.	
			Less.	More.	1880.	1879.
	£	£	£	£	£	£
Customs	5,340,	5,230,	—	110,	5,376,	5,356,
Excise	8,155,	8,212,	57,	—	6,700,	6,460,
Stamps	2,850,	2,961,	111,	—	3,105,	2,725,
Taxes	30,	30,	—	—	35,	26,
Post Office	1,830,	1,740,	—	90,	1,677,	1,630,
Telegraph Service	430,	400,	—	30,	395,	365,
	18,635,	18,573,	168,	230,	17,288,	16,562,
Property Tax	815,	618,	—	197,	660,	483,
	19,450,	19,191,	168,	427,	17,948,	17,048,
Crown Lands	130,	130,	—	—	135,	135,
Interest on Advances	385,	390,	5,	—	404,	326,
Miscellaneous	1,033,	1,209,	176,	—	1,053,	1,108,
<i>Totals</i>	20,998,	20,920,	349,	427,	19,540,	18,617,
			NET INCR. £78,			

YEARS, ended 31st Dec.	1882.	1881.	1882.		Corresponding Years.	
			Less.	More.	1880.	1879.
	£	£	£	£	£	£
Customs	19,458,	19,294,	—	164,	19,268,	19,750,
Excise	27,108,	27,252,	144,	—	25,770,	26,277,
Stamps	11,570,	11,369,	—	201,	11,965,	11,019,
Taxes	2,790,	2,745,	—	45,	2,719,	2,644,
Post Office	7,160,	6,875,	—	285,	6,570,	6,319,
Telegraph Service	1,690,	1,630,	—	60,	1,570,	1,375,
	69,776,	69,165,	144,	755,	67,862,	67,384,
Property Tax	9,882,	11,068,	1,186	—	9,495,	9,485,
	79,658,	80,233,	1,330	755,	77,357	76,869,
Crown Lands	380,	370,	—	10,	390,	399,
Interest on Advances	1,201,	1,232,	31,	—	1,337,	1,127,
Miscellaneous	5,106,	4,847,	—	259,	4,206,	4,272,
<i>Totals</i>	86,345,	86,682,	1,361	1,024,	83,290,	82,667,
			NET DECR. £337,			

LONDON CLEARING; CIRCULATION, PRIVATE AND PROVINCIAL.

The London Clearing, and the Average Amount of Promissory Notes in Circulation in ENGLAND and WALES on Saturday in each Week during the Year 1882; and in SCOTLAND and IRELAND, at the Dates, as under.

(£,000's omitted.)

ENGLAND AND WALES.					SCOTLAND.				IRELAND.		
DATES. <i>Saturday.</i>	<i>London:</i> Cleared in each Week on the preceding <i>Wednesday.</i>	Private Banks Fixed Issues, 3,551	Joint Stock Banks— Fixed Issues, 2,400.	TOTAL Fixed Issues, 5,951.	Average for four Weeks ending 2	£5 and upwards	Under £5.	TOTAL Fixed Issues, 2,681.	£5 and upwards	Under £5.	TOTAL Fixed Issues, 6,851.
1882.	£	£	£	£	1882.	£	£	£	£	£	£
Jan. 7....	159.72	1.70	1.68	3.39							
" 14....	110.39	1.72	1.71	3.43	Jan. 14..	1.78	3.80	5.59	3.91	3.29	7.20
" 21....	150.44	1.71	1.70	3.41							
" 28....	98.04	1.70	1.67	3.37							
Feb. 4....	164.81	1.69	1.66	3.35							
" 11....	104.42	1.65	1.65	3.30	Feb 11..	1.67	3.88	5.56	3.93	3.20	7.13
" 18....	153.85	1.61	1.65	3.27							
" 25....	111.57	1.59	1.64	3.23							
Mar. 4....	136.09	1.60	1.65	3.25							
" 11....	111.02	1.60	1.65	3.25	Mar 11..	1.59	3.54	5.12	3.84	3.05	6.89
" 18....	99.81	1.60	1.66	3.26							
" 25....	136.59	1.63	1.63	3.26							
April 1....	100.07	1.69	1.76	3.45							
" 8....	158.56	1.75	1.82	3.57	April 8..	1.59	3.57	5.16	3.95	3.00	6.96
" 15....	84.28	1.66	1.85	3.50							
" 22....	148.95	1.75	1.81	3.56							
" 29....	98.85	1.74	1.81	3.55							
May 6....	147.37	1.76	1.84	3.60	May 6..	1.71	3.69	5.41	4.15	3.03	7.18
" 13....	102.59	1.75	1.83	3.57							
" 20....	135.15	1.74	1.81	3.55							
" 27....	95.15	1.70	1.77	3.47							
June 3....	126.10	1.68	1.70	3.38	June 3..	2.17	4.12	6.29	4.12	2.95	7.10
" 10....	100.78	1.66	1.71	3.36							
" 17....	130.16	1.64	1.68	3.32							
" 24....	106.03	1.63	1.67	3.30							
July 1....	104.05	1.63	1.67	3.30	July 1..	1.89	3.88	5.78	4.03	2.87	6.91
" 8....	177.87	1.69	1.69	3.38							
" 15....	106.57	1.68	1.67	3.34							
" 22....	135.43	1.65	1.65	3.30							
" 29....	92.42	1.63	1.63	3.26	" 29..	1.77	3.93	5.60	4.00	2.80	6.80
Aug. 5....	139.34	1.64	1.64	3.28							
" 12....	89.03	1.63	1.64	3.28							
" 19....	129.02	1.61	1.62	3.24	Aug. 26..	1.72	3.77	5.49	4.02	2.83	6.85
" 26....	104.45	1.59	1.60	3.19							
Sept. 2....	110.87	1.60	1.62	3.22							
" 9....	105.02	1.61	1.64	3.25							
" 16....	119.15	1.63	1.65	3.28							
" 23....	100.07	1.67	1.67	3.34	Sept. 23...	1.76	3.87	5.62	4.13	2.98	7.11
" 30....	129.40	1.73	1.73	3.46							
Oct. 7....	117.88	1.83	1.81	3.64							
" 14....	102.67	1.87	1.83	3.70	Oct. 21...	1.83	3.99	5.82	4.62	3.32	7.94
" 21....	148.55	1.85	1.82	3.67							
" 28....	91.56	1.85	1.81	3.67							
Nov. 4....	144.97	1.83	1.82	3.65							
" 11....	102.38	1.82	1.81	3.63	Nov. 18...	2.10	4.26	6.36	4.90	3.58	8.48
" 18....	138.16	1.79	1.78	3.57							
" 25....	111.53	1.77	1.75	3.52							
Dec. 2....	95.04	1.75	1.75	3.50							
" 9....	145.33	1.72	1.71	3.44	Dec. 16...	2.09	4.28	6.37	4.77	3.56	8.33
" 16....	97.74	1.71	1.67	3.38							
" 23....	139.32	1.70	1.68	3.38							
" 30....	73.52	1.70	1.67	3.37							

BANK OF ENGLAND.

Pursuant to the Act 7th and 8th Victoria, cap. 32 (1844)

[0,000's omitted.]

1	2	3	4	5	6	7
ISSUE DEPARTMENT.					COLLATERAL COLUMNS.	
Liabilities.	DATES. (Wednesdays.)	Assets.			Notes in hands of Public. (Col. 1 minus col. 16.)	Minimum Rates of Discount at Bank of England.
Notes Issued		Government Debt.	Other Securities.	Gold Coin and Bullion.		
£	1882.	£	£	£	£	1881. Per cent.
Mlms.		Mlms.	Mlms.	Mlms.	Mlms.	
35,20	Jan. 4	11,02	4,73	19,45	26,16	12 Oct. 5
35,15	" 11	11,02	4,73	19,40	25,93	
35,37	" 18	11,02	4,73	19,62	25,44	1882.
35,20	" 25	11,02	4,73	19,45	25,18	1 Feb. 6
33,63	Feb. 1	11,02	4,73	17,88	25,34	
34,02	" 8	11,02	4,73	18,27	25,12	22 " 5
35,36	" 15	11,02	4,73	19,61	24,74	8 March ... 4
35,88	" 22	11,02	4,73	20,13	24,54	22 " ... 3
36,52	Mar. 1	11,02	4,73	20,77	25,01	
36,98	" 8	11,02	4,73	21,23	24,83	
37,83	" 15	11,02	4,73	22,08	24,59	
38,48	" 22	11,02	4,73	22,73	24,60	
38,66	" 29	11,02	4,73	22,91	25,17	
38,05	April 5	11,02	4,73	22,30	26,33	
38,07	" 12	11,02	4,73	22,32	26,12	
38,81	" 19	11,02	4,73	22,56	26,10	
38,51	" 26	11,02	4,73	22,76	25,94	
37,96	May 3	11,02	4,73	22,31	26,55	
37,64	" 10	11,02	4,73	22,89	26,21	
37,43	" 17	11,02	4,73	21,68	25,97	
38,04	" 24	11,02	4,73	22,38	25,75	
37,88	" 31	11,02	4,73	22,13	26,33	
37,95	June 7	11,02	4,73	22,10	25,99	
38,39	" 14	11,02	4,73	22,64	25,80	
39,04	" 21	11,02	4,73	23,29	24,55	
39,16	" 28	11,02	4,73	23,41	26,07	
38,90	July 5	11,02	4,73	23,15	26,97	
38,38	" 12	11,02	4,73	22,63	26,97	
38,47	" 19	11,02	4,73	22,72	26,65	
38,15	" 26	11,02	4,73	22,40	26,69	
37,64	Aug. 2	11,02	4,73	21,89	27,30	
36,94	" 9	11,02	4,73	21,19	27,13	16 Aug. 4
36,62	" 16	11,02	4,73	20,87	26,84	
36,70	" 23	11,02	4,73	20,95	26,47	
36,71	" 30	11,02	4,73	20,96	26,39	
36,50	Sept. 6	11,02	4,73	20,75	26,40	
36,49	" 13	11,02	4,73	20,74	26,20	13 Sept. 5
36,60	" 20	11,02	4,73	20,85	26,07	
36,96	" 27	11,02	4,73	21,21	26,19	
36,35	Oct. 4	11,02	4,73	20,60	27,13	
36,10	" 11	11,02	4,73	20,35	26,95	
36,08	" 18	11,02	4,73	20,33	26,67	
36,00	" 25	11,02	4,73	20,25	26,33	
35,08	Nov. 1	11,02	4,73	19,33	26,70	
35,20	" 8	11,02	4,73	19,45	26,29	
35,18	" 15	11,02	4,73	19,43	26,21	
35,34	" 22	11,02	4,73	19,59	25,66	
35,58	" 29	11,02	4,73	19,83	25,46	
35,60	Dec. 6	11,02	4,73	19,85	25,66	
35,72	" 13	11,02	4,73	19,97	25,34	
35,83	" 20	11,02	4,73	20,08	25,45	
35,41	" 27	11,02	4,73	19,66	25,70	

—WEEKLY RETURN.

for Wednesday in each Week, during the Year 1882.

[0,000's omitted.]

8	9	10	11	12	13	14	15	16	17	18
BANKING DEPARTMENT.										
Liabilities.					DATES. (Wednesdays.)	Assets.				Totals of Liabilities and Assets.
Capital and Rest.		Deposits.		Seven Day and other Bills.		Securities.		Reserve.		
Capital.	Rest.	Public.	Private.			Government.	Other.	Notes.	Gold and Silver Coin.	
£	£	£	£	£	1882.	£	£	£	£	£
Mins.	Mins.	Mins.	Mins.	Mins.		Mins.	Mins.	Mins.	Mins.	Mins.
14.55	3.18	6.27	24.85	.23	Jan. 4	12.24	26.20	9.04	.80	49.08
14.55	3.35	4.30	24.74	.24	" 11	14.81	22.29	9.22	.86	47.18
14.55	3.38	3.94	24.61	.24	" 18	13.66	22.22	9.93	.93	46.76
14.55	3.40	4.23	23.75	.20	" 25	12.71	22.44	10.02	.95	46.13
14.55	3.43	5.17	24.06	.23	Feb. 1	12.51	25.77	8.29	.89	47.46
14.55	3.45	6.80	22.93	.26	" 8	12.51	25.54	8.90	1.04	47.99
14.55	3.50	7.76	23.24	.24	" 15	13.13	24.38	10.62	1.13	49.26
14.55	3.45	8.67	23.32	.22	" 22	13.13	24.65	11.34	1.07	50.20
14.55	3.78	9.14	23.85	.21	Mar. 1	13.13	25.88	11.51	1.01	51.53
14.55	3.79	9.81	22.57	.20	" 8	13.20	24.74	12.15	1.07	51.22
14.55	3.80	9.79	23.73	.23	" 15	13.79	24.10	13.24	1.09	52.12
14.55	3.82	9.18	23.70	.20	" 22	14.00	23.35	12.88	1.23	51.46
14.55	3.83	10.07	24.04	.18	" 29	14.00	24.62	13.49	1.17	52.68
14.55	3.08	10.24	24.34	.21	Apr. 5	13.10	26.20	11.72	1.11	52.11
14.55	3.10	6.16	24.15	.21	" 12	12.58	22.25	11.95	1.10	48.48
14.55	3.11	5.50	24.88	.25	" 19	13.78	21.64	12.21	1.07	48.30
14.55	3.11	5.63	24.92	.22	" 26	13.78	21.46	12.57	1.12	48.44
14.55	3.11	5.41	23.26	.23	May 3	13.39	20.74	11.41	1.06	46.66
14.55	3.12	5.15	23.75	.23	" 10	13.49	20.87	11.43	1.02	46.79
14.55	3.12	5.61	23.66	.25	" 17	13.47	21.22	11.46	1.04	47.10
14.55	3.13	6.12	23.66	.23	" 24	13.47	20.88	12.29	1.10	47.67
14.55	3.08	5.74	24.95	.19	" 31	13.47	22.47	11.55	1.02	48.52
14.55	3.08	6.26	23.30	.26	June 7	13.77	21.78	11.96	.95	47.45
14.55	3.09	6.53	23.53	.25	" 14	13.77	20.59	12.59	1.00	47.95
14.55	3.09	7.33	23.90	.23	" 21	13.77	20.84	14.49	1.01	49.11
14.55	3.10	7.68	24.80	.22	" 28	13.78	22.51	13.09	.97	50.34
14.55	3.25	8.97	27.58	.21	July 5	13.75	22.64	11.93	.95	54.57
14.55	3.35	4.10	27.13	.27	" 12	14.65	22.61	11.41	1.04	49.71
14.55	3.37	3.46	28.36	.28	" 19	14.55	22.57	11.52	.95	49.69
14.55	3.38	3.86	27.46	.22	" 26	14.55	22.71	11.46	.94	49.47
14.55	3.41	3.82	26.40	.26	Aug. 2	14.55	22.88	10.34	.87	48.44
14.55	3.41	3.42	25.77	.23	" 9	15.95	22.75	9.51	.85	47.39
14.55	3.46	3.87	24.10	.23	" 16	12.75	22.75	9.75	.91	46.23
14.55	3.47	4.36	24.14	.24	" 23	12.75	22.90	10.23	.87	46.75
14.55	3.42	4.22	23.99	.20	" 30	12.46	22.79	10.32	.82	46.38
14.55	3.77	4.26	23.55	.23	Sept. 6	12.18	23.19	10.10	.91	46.37
14.55	3.79	4.65	23.57	.25	" 13	11.60	23.95	10.29	.87	46.82
14.55	3.81	5.25	23.20	.24	" 20	11.68	23.96	10.53	.89	47.05
14.55	3.81	5.10	23.90	.20	" 27	11.68	24.24	10.77	.75	47.57
14.55	3.81	4.54	23.93	.24	Oct. 4	11.87	25.09	9.22	.89	47.66
14.55	3.08	4.60	25.88	.26	" 11	13.98	24.40	9.15	.85	48.38
14.55	3.09	4.12	24.38	.28	" 18	12.93	23.18	9.41	.85	46.37
14.55	3.09	3.93	24.43	.25	" 25	12.73	23.10	9.67	.75	46.25
14.55	3.09	3.67	23.20	.23	Nov. 1	12.55	22.95	8.85	.83	44.74
14.55	3.09	2.51	23.30	.26	" 8	11.23	22.76	8.91	.80	43.70
14.55	3.10	2.53	22.59	.22	" 15	10.63	22.53	8.97	.88	43.01
14.55	3.10	3.60	22.66	.22	" 22	10.38	22.64	9.68	.84	43.54
14.55	3.08	4.06	22.11	.21	" 29	10.38	22.62	10.12	.80	44.01
14.55	3.06	4.52	22.44	.24	Dec. 6	11.35	22.47	9.94	1.00	44.82
14.55	3.06	5.00	22.01	.22	" 13	11.55	22.20	10.38	.88	44.84
14.55	3.07	6.06	22.08	.20	" 20	11.8	23.37	10.88	.82	45.96
14.55	3.08	6.95	21.88	.17	" 27	11.38	24.80	9.71	.74	46.63

FOREIGN EXCHANGES.—*Quotations as under, LONDON on Paris, Hamburg, and Calcutta;—and New York, Calcutta, and Hong Kong, on LONDON, for 1882.*

1	2	3	4 5		6	7	8 9	
DATES. (Approximately.)	London on Paris. 3 m. d.	London on Hamburg 3 m. d.	Calcutta.		New York on London. 60 d. s.	Hong Kong on London. 4 m. d.	Price per Ounce.	
			London on Calcutta.	Indian Council Bills. Minimum Price Per Rupee.			Gold Bars (Fine).	Standard Silver in Bars.
1882.			<i>d.</i>	<i>d.</i>	Per cent.	<i>d.</i>		<i>d.</i>
Jan. 5 ...	25·60	20·72	20	19 $\frac{1}{10}$	4·79 $\frac{3}{4}$	45 $\frac{1}{2}$	77·9	52
„ 19 ...	25·58 $\frac{3}{4}$	20·72	20 $\frac{1}{8}$	20	4·82 $\frac{1}{2}$	45 $\frac{1}{4}$	77·9 $\frac{1}{2}$	51 $\frac{7}{8}$
Feb. 2 ...	25·60	20·77	20 $\frac{1}{4}$	20 $\frac{1}{10}$	4·84 $\frac{3}{4}$	45 $\frac{1}{2}$	77·9 $\frac{1}{2}$	52
„ 16 ...	25·65	20·75	20 $\frac{1}{4}$	20 $\frac{1}{10}$	4·84	45 $\frac{1}{4}$	77·9	52 $\frac{1}{10}$
Mar. 2 ...	25·57 $\frac{1}{2}$	20·72	20 $\frac{1}{4}$	20	4·85 $\frac{1}{4}$	45 $\frac{1}{4}$	77·10	52
„ 16 ...	25·62 $\frac{1}{2}$	20·71	20 $\frac{1}{4}$	20	4·84 $\frac{3}{4}$	—	77·9	51 $\frac{7}{8}$
April 6 ...	25·60	20·70	20 $\frac{1}{4}$	20 $\frac{3}{10}$	4·86 $\frac{1}{4}$	45 $\frac{3}{8}$	77·9	52 $\frac{1}{8}$
„ 20 ...	25·55	20·68	20 $\frac{1}{4}$	20 $\frac{1}{8}$	4·86 $\frac{1}{4}$	45	77·9	52 $\frac{1}{8}$
May 4 ...	25·52 $\frac{1}{2}$	20·68	20 $\frac{1}{4}$	20 $\frac{1}{8}$	4·86 $\frac{3}{4}$	45 $\frac{3}{8}$	77·9	52 $\frac{7}{10}$
„ 18 ...	25·46 $\frac{1}{4}$	20·66	20 $\frac{1}{4}$	20 $\frac{1}{10}$	4·86 $\frac{1}{2}$	45 $\frac{3}{8}$	77·9 $\frac{3}{4}$	52 $\frac{3}{8}$
June 1 ...	25·45	20·66	20 $\frac{1}{4}$	20 $\frac{1}{10}$	4·86 $\frac{1}{4}$	45 $\frac{7}{8}$	77·9 $\frac{3}{4}$	52 $\frac{3}{10}$
„ 15 ...	25·45	20·66	20 $\frac{1}{4}$	20	4·86 $\frac{1}{2}$	46	77·9 $\frac{3}{4}$	52 $\frac{1}{2}$
July 6 ...	25·45	20·68	20 $\frac{1}{8}$	20	4·84 $\frac{3}{4}$	45 $\frac{1}{2}$	77·9 $\frac{1}{2}$	51 $\frac{7}{8}$
„ 20 ...	25·42 $\frac{1}{2}$	20·70	20 $\frac{1}{8}$	—	4·85 $\frac{1}{4}$	45 $\frac{3}{8}$	77·9 $\frac{1}{2}$	51 $\frac{3}{4}$
Aug. 3 ...	25·42 $\frac{1}{2}$	20·69	20 $\frac{1}{4}$	—	4·85	45 $\frac{1}{2}$	77·10	52
„ 17 ...	25·47 $\frac{1}{2}$	20·72	20 $\frac{1}{4}$	20	4·85 $\frac{1}{4}$	45 $\frac{1}{2}$	77·10	51 $\frac{1}{10}$
Sept. 7 ...	25·51 $\frac{1}{4}$	20·71	20 $\frac{1}{4}$	—	4·84	45 $\frac{3}{4}$	77·9	52
„ 21 ...	25·57	20·77	20 $\frac{1}{4}$	20	4·82 $\frac{1}{2}$	45 $\frac{3}{8}$	77·9	51 $\frac{7}{8}$
Oct. 5 ...	25·61 $\frac{1}{4}$	20·76	20 $\frac{1}{4}$	19 $\frac{7}{8}$	4·80	45 $\frac{1}{2}$	77·9	51 $\frac{3}{4}$
„ 19 ...	25·55	20·72	20 $\frac{1}{4}$	19 $\frac{7}{8}$	4·81 $\frac{1}{4}$	45 $\frac{3}{8}$	77·9	51 $\frac{1}{10}$
Nov. 2 ...	25·52 $\frac{1}{2}$	20·69	20	19 $\frac{7}{8}$	4·80 $\frac{1}{2}$	45	77·9	51 $\frac{5}{8}$
„ 16 ...	25·52 $\frac{1}{2}$	20·67	20	19 $\frac{3}{4}$	4·80	44 $\frac{1}{2}$	77·9 $\frac{1}{4}$	51 $\frac{5}{10}$
Dec. 7 ...	25·52 $\frac{1}{2}$	20·66	19 $\frac{5}{8}$	19 $\frac{7}{10}$	4·79 $\frac{1}{2}$	44 $\frac{1}{4}$	77·9 $\frac{1}{2}$	50 $\frac{3}{4}$
„ 21 ...	25·52 $\frac{1}{2}$	20·67	19 $\frac{3}{8}$	19 $\frac{1}{10}$	4·80 $\frac{1}{4}$	43 $\frac{3}{4}$	77·9 $\frac{1}{2}$	50 $\frac{3}{8}$

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The RECENT DECLINE in the ENGLISH DEATH-RATE, and its EFFECT upon the DURATION of LIFE. By NOEL A. HUMPHREYS, ESQ.

[Read before the Statistical Society, 17th April, 1883. The PRESIDENT in the Chair.]

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THE Registrar-General's mortality statistics prove beyond doubt that a marked decline has occurred in the national death-rate in recent years. There appears, however, to prevail a singular reluctance to accept this decline of mortality as evidence of the improved health and sanitary condition of the English people, or to recognise that it necessarily implies an increase of the mean duration of life in England.

The opponents of sanitation, prior to 1871, urged that the stationary death-rate was conclusive proof of the futility of sanitary labour and expenditure, refusing to recognise the fact, that the death-rate was stationary in spite of the rapid increase of urban aggregation, as proof of the existence of a powerful counteracting influence. The late Dr. Letheby (although himself a health officer) and others, went so far as to deny that a high death-rate was an unmixed evil. Dr. Letheby said that "an increase in the rate of mortality is often a sign of prosperity, for a high death-rate means a high birth-rate, and a high birth-rate is the invariable concomitant of prosperity." This theory was founded upon an entire misconception, but it was so satisfactory to the sanitary authorities of urban districts having both high birth and high death-rates, that it was long before its fallacy was generally recognised.

Now that an unquestionable decline in the death-rate has set in, considerable ingenuity is displayed in the attempt to question the advantage which results to the community from such a decline.

The decline in the English death-rate was discussed at some length in the Registrar-General's report for 1879, which was published in June, 1881, and attention was then called to two facts in connection with this decline; namely, the marked decrease of the death-rate in childhood, and coincidently therewith an increased death-rate among adults.

Attempts to explain these apparently contradictory facts seem to have suggested some of the false theories, and unsound arguments, which have been urged against the natural and true conclusions to be drawn from the decline in the death-rate. A leader writer in the "*Spectator*," in July, 1881, under the heading "*Improvement of Human Health*," asks, with reference to the decline in the death-rate, "what is the kind of life which is increasing, whether "it is young life or mature life, or aged life which is being "enlarged? Are we young longer, or mature longer, or old "longer?" These were and are reasonable inquiries, but the spirit in which the inquiry was made is shown by the context, "or, in "fuller words, do we gain from all our costly and troublesome "hygienic devices a longer period during which we retain the full "energy of youth, or a longer duration of the period of wisdom—"such as wisdom is—or a greater stretch of old age? Do we live "longer, in fact, or are we only a little slower in dying?"

This article was followed by a remarkable letter from Dr. J. Mortimer-Granville (the author of a series of works on health), in which this line of thought was amplified with reference to a supposed analogy between the decline in the national death-rate and the increased duration of life in lunatic asylums under recently improved management. Dr. Granville asserted that "the recent "improvement effected by science consists in a prolongation of the "passive endurance of life, rather than an extension of the power "of true vitality or any increase of the opportunity for good work "and for intellectual enjoyment." He deprecated therefore the excessive energy recently devoted to the conservation of health, and the inordinate and laborious means taken to avoid disease and death, and asserted that the pursuit of health and the yearning for longevity had become a craze, almost amounting to madness. No serious attempt was made in this letter to state the grounds on which Dr. Granville based his interpretation of the decline in the death-rate; it is, therefore, only important as a suggestion of the line of argument often adopted by those who disbelieve both in death-rates and in sanitation.

The main object of this paper is to determine, if possible, what

will be the real effect of a continuance of the recent changes in the rate of mortality upon the duration of life in England. This should, to some extent, supply an answer to the inquiries suggested by the "Spectator," and at the same time refute some of Dr. Granville's assertions. Before however addressing myself to the solution of this problem, it may be useful to refer briefly to one or two other efforts in the same direction.

A discussion on the subject was commenced in the "British Medical Journal" by three letters from Dr. Rabagliati of Bradford, towards the close of 1881. Of the numerous other letters that have since been contributed to this discussion, none however call for special notice here except those of Mr. Biddle, of Kingston-upon-Thames. The results of the correspondence were mainly negative, although the letters both of Dr. Rabagliati and Mr. Biddle were full of technical interest, and displayed careful and laborious effort to solve the difficulty.

I propose to point out one or two of the flaws in the arguments of these two correspondents of the "British Medical Journal," before stating the results of my own investigations.

Finding that the death-rate is mainly reduced among children, Dr. Rabagliati assumed the impossible possibility of ten years each being added to the lives of 10 millions of infants and children under five years of age who would otherwise have died, and asks, "at the end of ten years how much the better should we be?" This of course assumes the extinction of all these lives at the end of the ten years: but is this a fair assumption? Why did not Dr. Rabagliati investigate the effect of the survival of these millions of infants during the ten years, to be afterwards liable to the usual death-rates at subsequent ages? Then Dr. Rabagliati's attempt to use the mean age at death to support his assertion that the recent saving of life was confined to childhood, led him to completely false conclusions. Conclusions as to the mean duration of life, based upon the mean age at death in the English population (with its large excess of births over deaths), are necessarily fallacious. So also are conclusions based upon the proportions of deaths occurring at groups of ages, to deaths at all ages. The mean age at death in England gives scarcely an approximation to the mean duration of life of a generation, than which it is necessarily much lower, owing to the unduly large proportion of children, and the small proportion of elderly persons in the population. The proportions of deaths occurring at groups of ages, to deaths at all ages, are deceptive, because it is not only possible but frequently occurs, that the proportion of deaths at a particular group of ages shows a reduction, whereas the proportion of deaths to persons living at that group (which constitutes the true death-rate) shows an increase.

An exceptional mortality at any one group of ages changes the proportion to total deaths at each of the other groups. Thus an epidemic of scarlet fever, mainly fatal between five and ten years of age, would reduce the proportion of deaths to total deaths at every other group of ages, although there might be no decline in the true rate of mortality at those groups. But to return to Dr. Rabagliati's letters. He found that the mean age at death of persons dying in England in recent years, although showing an increase at all ages, had declined both under 35 years, and above that age. He appears to have been led from this apparent contradiction to conclude that the increase of the mean age at death of the whole population was not a reality.

This contradiction however is only apparent, as the true mean duration of life, calculated by the life table method, shows an increase, although the mean age at death both under and over 35 years has declined. Dr. Rabagliati asserted, however, that his figures proved "beyond doubt that life over 35 years of age is now "shorter than it was a generation ago, and therefore that the "expectation of life is less now for the useful ages than it was "then." This paper is intended to show that this assertion is misleading.

Mr. Biddle in his elaborate paper arrived, on the whole, at sounder conclusions than Dr. Rabagliati as regards the duration of life in England, for he says, "so far as the useful years of life are "concerned, there is no doubt that a greater proportion of those "who are born live through them;" and after a careful examination of the question propounded by Dr. Rabagliati, is of the opinion that "the state of things is not so bad as he has tried to "make out." His paper, however, was principally remarkable for his enunciation of a new method of mortality statistics which he suggests as a substitute for the national system of death-rates. "The method adopted by the Registrar-General," he writes, "of "comparing the number of deaths at a given age with the number "of persons living of that age, though useful in some respects, is "unsatisfactory as an index of the comparative health and vitality "of the people at different epochs. An exaggerated instance will "show how fallacious its declarations might be. Suppose that on "an island, at the beginning of a given year, 800 males were alive, "each 66 years of age, but that some fearful pestilence arose which "carried off 400 of them before the year closed, the Registrar-General would report that the deaths of males aged 66 were for "that year 500 per 1,000. The next year the males aged 67 would "be 400 in number, and if only 200 of these died during that year "the death-rate would still be entered as 500 per 1,000 for males "aged 67, the same as in the previous year for those aged 66. In

“fact, the second of the two years would gain a bad name, simply from the fact that it was preceded by a bad year, which is manifestly unfair. . . . If in the above instance the deaths were compared properly with the births, the death-rate in the latter year would rightly appear as only half that of the former.” I have quoted this example at length because it affords the most convenient means of refuting the eligibility of Mr. Biddle’s suggested new method of mortality statistics. Judged by his own standard, that is “as an index of the comparative health and vitality” of the male population aged 66 and 67, of this imaginary island, is it necessary to ask whether the Registrar-General’s or Mr. Biddle’s method would give the more trustworthy result? The Registrar-General would say that the rate of mortality implied by 200 deaths out of 400 living, is the same as that implied by 400 deaths out of 800 living. Mr. Biddle says the former mortality would rightly appear as only half that of the latter. To measure the deaths in each year of the life-time of a generation by the number of births, of which the generation was originally composed would be meaningless and useless. The result would show no more than the bare numbers of deaths, and would lead to the worse than barren result of Mr. Biddle’s own example.

Mr. Biddle and others who, dissatisfied with the national system of death-rates, would fain provide a more convenient and more infallible system of mortality statistics should, if they have not already done so, study Mr. Milne’s valuable treatise upon human mortality in the “*Encyclopædia Britannica*.” It is there laid down as an axiom, that in order to calculate a correct death-rate “the grand desideratum is to determine the number of annual deaths at each age which take place among a given number of the living at the same age.”

We will now proceed to consider the extent and nature of the recent decline in the English death-rate, and then to estimate its effect upon the lifetime of a hypothetical generation, or what may be called a Life Table population.

I.—*The Decline in the English Death-Rate.*

It is scarcely necessary to say that very little is known of the variations in the annual death-rate in England prior to the establishment of civil registration in 1837. The Registrar-General’s mortality statistics embrace the forty-five years 1838-82, and constitute the only trustworthy basis for calculations as to the duration of life in England.

Although the death-rate varied from year to year, it may be said to have remained practically stationary during the thirty-three years 1838-70. The extreme range during this period was from

24.7 and 25.1 in 1847 and 1849, to 20.5 in 1856. The high rates in 1847 and 1849 were due to epidemics of influenza and cholera. If we divide this series of years into what we may call census decades, we shall find a remarkable equality in the mean death-rates. The rate averaged 22.3 in the three years 1838-40, 22.4 in the ten years 1841-50, 22.2 in the ten years 1851-60, and 22.5 in the ten years 1861-70.

It has been previously stated that the absence of decline in the English death-rate prior to 1871 was frequently urged as evidence of the futility of sanitary efforts, the counteracting influence of rapidly increasing urban aggregation being entirely ignored.

Early in the most recent decade, 1871-80, the Public Health Act of 1872 became law. The passing of this Act, and the further Act of 1875, marked an eventful epoch in the history of sanitary progress in England, and it appears impossible to doubt that the operation of these Acts, themselves due to the awakening of national interest in health matters, has proved a powerful factor in the recent marked decline in the English death-rate which we are now considering.

The mean death-rate in the five years 1871-75 fell to 22.0, and in the following five years, 1876-80, it further fell to 20.8. For the purposes of this paper our consideration will be mainly confined to the reduced death-rate in the five years 1876-80, but we may here note that this marked decline was more than maintained in the two following years, 1881 and 1882, when the unprecedentedly low rates 18.9 and 19.6, were respectively recorded. Thus the mean death-rate in the first two years of the current decade, 1881-90, was so low as 19.3 per 1,000, implying that more than 150,000 persons survived those two years, whose deaths would have been recorded had the mean rate of mortality that prevailed in the thirty years 1841-70 been maintained.

Let us now proceed to analyse this marked decline in the English death-rate in 1876-80, which as we have seen was more than fully maintained in 1881 and 1882. In Tables I and II will be found the means of tracing the changes in the death-rates of males and females at twelve groups of ages during the eight quinquennials of 1841-80. As our object is, however, not only to consider these changes, but more especially to estimate their effect upon the expectation and duration of life in England, it will be more convenient to institute a comparison between the rates that prevailed in the seventeen years 1838-54, which served as the basis of Dr. Farr's English Life Table No. 3, and the reduced rates recorded in 1876-80. The figures necessary for this comparison will be found in Table III.

In analysing the decline shown by this comparison, let us first

consider it with reference to the death-rate of males and females, and secondly with reference to its incidence at various groups of ages.

The death-rate of males, which averaged 23·25 during the seventeen years 1838-54, fell to 22·16 in 1876-80, equal to a decline of 4·7 per cent. The death-rate of females fell from 21·64 in 1838-54 to 19·54 in 1876-80, equal to a decline of 9·7 per cent. Thus while the relative mortality of males to females was 107 to 100 in 1838-54, it had increased to 113 to 100 in 1876-80. Tempting as it is to investigate and speculate upon the causes of the recent decline of English mortality being so much more marked among females than among males, this would involve a digression from our main object, and we must pass on to consider the varying incidence of this decline upon the rates of males and females at various groups of ages.

The Registrar-General's mortality statistics deal with twelve groups of ages; these groups are quinquennial up to 25, and afterwards decennial up to the twelfth group, including those aged 85 and upwards. Our consideration will necessarily be confined to the death-rates at these twelve groups.

Among males aged under 5 years the decline in the rate was from 72·2 to 67·2 per 1,000, equal to 7·0 per cent. The most marked decline is shown at the next five groups of ages, being equal to 30 per cent. at age 5-10, 32 per cent. at 10-15, 30 per cent. at 15-20, and 28 per cent. at 20-25. The decline did not exceed 13 per cent. at the next group, 25-35, whereas an actual increase occurs at the four next age periods, equal to 5 per cent. at 35-45, 4 per cent. at 45-55, 9 per cent. at 55-65, and 1 per cent. at 65-75. At 75-85 and at 85 and upwards the male death-rates in 1876-80 were again slightly below those of 1838-54. Thus at each of the twelve groups of ages, except the four decennials 35-75, the death-rate in 1876-80 was lower than in the seventeen years 1838-54, the main decrease occurring in the thirty years 5-35. The increase in the death-rate was confined to the four decennials between 35 and 75, and was greatest (9 per cent.) in the period 55-65.

The proportional decline in the death-rate of females in 1876-80, compared with the earlier period, 1838-54, was, as we have seen, more than double that shown by the male death-rate: at all ages it was 9·7 per cent. instead of 4·7. The decline of the female rate was 8 per cent. under 5 years, 33 per cent. at 5-10, and 35 per cent. both at 10-15 and at 15-20. The percentage of decline fell steadily at the next four age groups to 6 per cent. at 45-55. An increase of mortality was shown at the next two groups, equal to 2 per cent. at 55-65 and 0·6 per cent. at 65-75. At 75-85 and

at 85 and upwards, however, the death-rate of 1876-80 was again below that of 1838-54 to the extent of 1·6 and 4·9 per cent. respectively.

The net result of this analytical comparison is as follows: The death-rate of males in 1876-80 showed a decline at each age period, except the four decennial groups between 35 and 75. The death-rate of females showed a decline at each of the age periods, except the two between 55 and 75; the decline among females was, without exception, considerably larger, while the increase between 55—75 was much smaller, than was shown at the corresponding age groups among males.

II.—*Relative Mortality of Males and Females.*

A word or two on the relative mortality of males and females is now desirable. In 1876-80, as in 1838-54, the rate of mortality among males exceeded that which prevailed among females at each of the twelve groups of ages except in the two quinquennials between 10 and 20, when the rates among females exceeded those among males; but as the decline in the female rates at these ages in 1876-80 was greater than among males, the actual excess of the female over the male rate did not exceed 1·7 per cent. at the 10—15 group, and was not more than 3·5 per cent. between 15 and 20.

At each of the other ten age periods the rate among males showed in 1876-80 a larger excess than in 1838-54; the excess at all ages being equal to 13·4 per cent. in 1876-80, against but 7·4 per cent. in 1838-54. If we examine the varying excess of male mortality at the ten age groups at which an excess prevailed in 1876-80, we find that it was equal to 18 per cent. under 5 years of age, and was 8, 9, and 10 per cent. at 5—10, 20—25, and 25—35 respectively. The excess of male mortality at each of the three next decennials was much larger, and equal to 20, 27, and 20 per cent. respectively. After 65 the relative excess of male mortality fell again, being 12 per cent. at 65—75, and 11 per cent. both at 75—85 and 85 and upwards. A most marked change occurred in the relative mortality of males and females aged 25—45 between the two periods under notice. At 25—35 male mortality in 1838-54 was 5 per cent. below, whereas in 1876-80 it was 10 per cent. above that prevailing among females; at 35—45 the excess of male mortality was only 0·5 per cent. in 1838-54, whereas it had risen to 20 per cent. in 1876-80. These changes in the relative mortality of males and females are due more to the increased vitality of females than to the increased mortality of males.

III.—*A New English Life Table.*

Having now fully considered the recent decline in the English

death-rate among males and females both at all ages, and at each of the Registrar-General's twelve groups of ages, we must now proceed to consider the effect of these various changes upon the duration of life in England. We have once more to urge that the mean age at death in the English population gives no real indication of the national mean duration of life, owing to the abnormally large proportion of infants and children among the population, caused by the excess of births over deaths. In order therefore to ascertain the true mean duration of life in a generation of people, recourse must be had to the Life Table method, which can alone eliminate the disturbing influence of the excess of births over deaths, and of abnormal age distribution from other causes. By this method, and by this method alone, does the mean age at death become equivalent to the mean duration of life of a generation. In order therefore to ascertain the true mean duration of life of an English generation liable to the changed rates of mortality that we have found to have prevailed in 1876-80, the construction of a new English Life Table became absolutely necessary. Dr. Farr's English Life Table No. 3 was based upon the experience of the seventeen years 1838-54, but as we have seen that English mortality was in the main unchanged during the thirty years 1841-70, a comparison by the Life Table method of the periods 1838-54 and 1876-80 will show the probable result upon the nation's vitality of the recent marked reduction of the death-rate which set in so soon as the Public Health Acts of 1872 and 1875 had fairly come into operation.

It will be well to refer here to the existence of what at first appeared a serious drawback to the adoption at the present time of the Life Table method to the solution of the problem before us. The Census Report, which will show the age distribution of the English population enumerated in 1881, has not yet been issued; consequently the rates of mortality at the various age periods during the years 1876-80, as published in the Registrar-General's Annual Reports, have of necessity been calculated upon the numbers living in such age periods estimated in accordance with the age distribution found to prevail in 1871. In a population however with fairly constant birth and death-rates, and a consequently fairly constant excess of births over deaths, the age distribution (as may be mathematically proved) assumes, after a certain period, fixed proportions. These conditions are in the main applicable to the English population, and in point of fact the proportional age distribution of the enumerated population in 1861 and 1871 was almost identical. The final tabling of the ages of the population enumerated in 1881 is now approaching completion at the Census office, and I have authority to state, that so far as these numbers are at present fixed the proportional age distribution at

the last census mainly corresponds with that in 1871. With the advantage of this knowledge, I no longer hesitated to apply the Life Table method to the death rates in 1876-80 for the purpose of calculating the corresponding true mean duration of life, or in other words the expectation of life at birth.

The desired object was to trace the vitality and mortality of a hypothetical generation of persons liable to the recorded mean death-rates in the five years 1876-80 from birth to its extinction by death. The initial number of this hypothetical generation at birth was fixed at a million, to facilitate comparison with Dr. Farr's English Life Table No. 3. For the same reason it was assumed to consist of males and females in the proportions found to prevail among registered births in England in 1876-80.

The only difference in the constitution of the theoretical populations dealt with by Dr. Farr's Life Table and the new Life Table arises from the fact that the sex proportion of 1,000 births registered in 1838-54 was 512 males to 488 females, whereas in 1876-80 the proportion was 509 males to 491 females, the excess of males over females born having recently declined. This difference in the radix of the Life Table does not affect in any way the value of the two Tables for comparative purposes as regards the sexes taken separately. As regards the million of persons in the aggregate, it does, however, make a slight difference, as the proportion of males is rather smaller in the new than in the older Life Table, which very slightly increases the vitality of the generation.

The sole object of the construction of this new Life Table is to show what the effect would be upon the mean duration of life in England of a continuance of the recent reduction in the death-rate. The basis of recorded facts upon which the Table has been constructed is therefore of necessity comparatively small, extending over but five years instead of seventeen years, as was the case with Dr. Farr's last table. From an Insurance point of view the limited basis of facts employed may detract from the value of the new Table; but it is not on this account any the less serviceable for the purpose for which it has been constructed.

Before discussing the results derived from the new Table (see Tables IV and V) it will be desirable to describe briefly the method employed in its construction. The first process was to ascertain the mean annual death-rate in the seventeen years 1838-54 and in the five years 1876-80, at each of the twelve groups of ages dealt with by the Registrar-General in his annual reports; then to calculate the rate of increase or decrease between the relative rates prevailing in these two periods at each group of ages. These results are shown in Table III.

Then starting with the annual mortality of males in *each year*

of age according to Dr. Farr's English Life Table No. 3, these rates (see Col. 1 of Table IV) are reduced or raised in accordance with the relation between the mean mortality that prevailed in the several groups of ages in 1838-54 and in 1876-80 respectively. For instance, it is shown in Table III that at the first group of ages (0—5) the mean annual death-rate of males declined from 72.25 per 1,000 in 1838-54, to 67.20 in 1876-80, equal to a decrease of 6.986 per cent. It has been assumed that the rate of mortality in each of the first five years of age, as shown in Dr. Farr's Table, had declined in the same proportion as the rate for the entire group of five years. Each of the first five rates in Col. 1 was therefore multiplied by .93014, reducing each of them by 6.986 per cent., and thus constituting the "corrected rate of mortality" for each of the first five years of age appearing in Col. 2 of Table IV.

The yearly rates in each group of ages were dealt with in a similar manner, the rates for the five years 5—10 being reduced 29.955 per cent.; those for the five years 10—15 32.155 per cent., and so on through each of the twelve groups of ages. These corrected rates of mortality at each year of age constitute the m_x column of the new Life Table. There is an obvious defect in this series of corrected annual rates of mortality, namely, the irregularities due to the assumption that the changes in the proportions of decrease in the mean rates of succeeding age periods, took place suddenly at the commencement of each period, instead of coming gradually into operation, as was certainly the case. The series would undoubtedly look better, and would probably be more technically correct if these irregularities had been graduated and smoothed away, but having regard to the intended purpose of the Table, this process has been omitted.

From this mortality (m_x) column the probability of living at each year of age (p_x) has been obtained by the formula $p_x = \frac{2 - m_x}{2 + m_x}$. Thus $2 - .17046$ divided by 2.17046 gives .84293 which represents the corrected probability of a male living one year from birth. By this process the probability of living one year is obtained for each year of age in the series.

The next column required is one showing the numbers born and living at each age (l_x). We start, for reasons that have already been described, with 509,208 males at birth, and having ascertained the probability at birth of living one year to be .84293, the survivors attaining one year of age (or l_1) may be obtained by multiplying 509,208 by .84293. Carrying on this process of multiplying the numbers surviving to each year of age by the probability at that age of living one year, the survivors to the next age are successively obtained, until the generation becomes extinct. Thus the formula

used for obtaining the l_x column is:—($l_x \times p_x = l_{x+1}$). This process, laborious by common arithmetic, is shortened by the use of logarithms. By adding the logarithm of p_0 to the logarithm of l_0 , the logarithm of l_1 , or the number calculated to complete the first year of life, is obtained. The addition of the logarithm of p_1 to the logarithm of l_1 in like manner gives the logarithm of l_2 , and so on to the end of the series.

The next necessary column for our purpose is one showing the mean numbers living *in* each year of age, which is obviously less than the number surviving *to*, or living *at the commencement of* each year. This column is described in a life table as P_x , meaning the mean population living during the year following each age in the series. It is assumed that the number living in each year of age is the arithmetical mean of the numbers living at the beginning and at the end of the year. P_x is therefore equal $\frac{l_x + l_{x+1}}{2}$. This also indicates the number of years of life lived in the year from age x to age $x+1$.

The last column given in the table is what is technically called the Q_x column. The number against any age in this column is the sum of all the numbers in the P_x column from that age to the end of the Table. It therefore shows the aggregate number of years which the males at each age in the Table will live, until their extinction by death. Thus Q_0 is equal to 21,347,889, showing that according to this Life Table the generation of 509,208 male infants at birth (which was assumed as the radix of the male Table) would live this aggregate number of years before final extinction by death. And $\frac{Q_x}{l_x}$ gives the mean future life time of all the persons living at age x

in the Table, and as $\frac{21,347,889}{509,208} = 41.92$, the mean duration of life of a generation of males subject to the mean rates of mortality that prevailed at twelve groups of ages during the five years 1876-80 would be 41.92 years.

Having thus traced through its various processes the formation of our new outline Life Table for males, we need only further say (1) that the table for females was constructed in a precisely similar manner, and (2) that the addition of the l_x , P_x , and Q_x columns for males and females respectively will give similar columns for persons. The l_x column for persons (showing the numbers born and living at the commencement of each year of life) thus starts with a hypothetical million persons, of whom 509,208 are assumed to be males and 490,792 females.

We are now provided, by means of the Life Table method, with the necessary materials for satisfactorily estimating the true effect

upon the mean duration of life, of the recent decline in the English death-rate, and thus to reply to the inquiries suggested by the "Spectator," Dr. Mortimer Granville, and Dr. Rabagliati, and at the same time to refute various assertions to which many writers on the subject have been led by the use of false methods.

IV.—*Mean Duration of Life, and Mean After-Lifetime (Expectation of Life) at Various Ages.*

Let us now, with the help of our new Life Table and by means of its comparison with Dr. Farr's English Life Table No. 3, see to what extent and in what manner the duration of life, and the expectation of life at various ages in England, would be altered by a continuance of the reduced rates of mortality that prevailed in England during the five years 1876-80.

Dr. Farr's Life Table made the mean duration of life or mean after-lifetime of males at birth 39·91 years, whereas the new Table raises it to 41·92 years, an increase of rather more than two years, equal to the addition of 5 per cent. to the mean duration of the lifetime of males. The mean after-lifetime of females, which according to Dr. Farr's Life Table was 41·85 years, is extended by the new Table to 45·25, representing the addition of no less than 3·40 years, or more than 8 per cent. to the average lifetime of all females born.

The mean lifetime of a generation of persons (the sex proportion being fixed by that of births of live-born children) was determined to be 40·86 years by Dr. Farr's Life Table, whereas the new Table raises it to 43·56 years, showing an increase of 2·70 years, equal to nearly 7 per cent. Thus the reduced death-rate, if the reduction be maintained, signifies the average addition of a fifteenth to the lifetime of every infant born.

It must be borne in mind that in the theoretical Life Table populations with which we are now dealing, the mean age at death of an entire generation gives accurately the mean duration of life. This is very far from being the case in a population like that of England, in which the births so considerably exceed the deaths, causing an unduly large proportion of young persons and an unduly small proportion of elderly persons. Thus the *mean age at death* of persons dying in the five years 1876-80 did not exceed 32 years; whereas we find that calculated by the Life Table method the rates of mortality prevailing in these five years would give a true *mean duration of life* of 43·56 years. We may also notice here that Dr. Rabagliati, in his first letter to the "British Medical Journal," attempted to calculate the mean duration of life by another method, which, although applicable to a Life Table rate of mortality, is untrustworthy when applied to the death-rate of an

ordinary population, in which the births and deaths do not balance each other. Dr. Rabagliati, with reference to an average English death-rate of 21·0 per 1,000 in the four years 1876-79, states that this is equivalent to an average duration of life of 47·6 years; now this, as we know, is above, just as the mean age at death is below, the true mean duration of life.

The mean duration of life in a Life Table population may always be obtained by dividing 1,000 by the average annual death-rate per 1,000 at all ages. In a population like that of England, however, the recorded death-rate at all ages (owing to the abnormal age constitution of the population due to the excess of the birth-rate over the death-rate) is considerably below its true death-rate after correction for abnormal age constitution; therefore, the mean duration of life cannot be obtained by Dr. Rabagliati's simple method, any more than it can by the equally simple method of ascertaining the mean age at death.

But to return to the consideration of the expectation of life in England at different ages, as affected by the recent decline in the death-rate. We have seen that at birth the expectation of males is greater now by rather more than two years than it was in 1838-54. This increased expectation decreases steadily at each age with the decrease of the proportional decline in the death-rate. At the groups of ages 35—75, indeed, in which the death-rate of males was higher in 1876-80 than in 1838-54, the expectation of life is actually lower than it was, thus corroborating the letter though not the spirit of Dr. Rabagliati's statement that "the expectation is less now for useful ages than it was."

The increased expectation of life of males at 20 falls to 0·38 of a year, and at the four next decennial age periods the decrease of life expectation ranges from 0·07 to 0·52 of a year; after 75 years a slightly increased expectation again prevails.

The increased expectation of life of females at birth is, as we have seen, 3·40 years. This declines steadily at each successive age period to 0·15 of a year at 45, and at age 55 the expectation, owing to the increased death-rate, shows a decline of 0·06 of a year. The expectation of female life at 65 years and upwards again shows an increase, due to the decline in the death-rate at these ages.

So far our examination of the new Life Table teaches us that the true import of the reduced death-rates of 1876-80 is an increased expectation of life at birth of two years among males, and nearly three and a half years among females. The variations in the expectation of life at subsequent ages are naturally governed by the death-rates prevailing. Except therefore by expressing the facts in another way, the calculation of the expectation of life at the several ages with which we have just been dealing, tells us little more than the

death-rates. The increased death-rates among male adults aged from 35 to 75, and among female adults aged between 55 and 75, naturally imply that the probability of living through those periods has decreased. Thus, notwithstanding the increased expectation at birth, the improvement appears to be lost for a term of years after age 25 for males and 55 for females. Hence Dr. Rabagliati's despondent view of the effect of the recent decline in the death-rate, and his assertion that the duration of life has not really increased at the useful ages. In order, however, to arrive at a sound conclusion on this assertion, we must look at these figures from another point of view.

V.—*Dependent and Useful Lifetime.*

The reason why the national gain arising from the recent general decline in the death-rate has been undervalued is, that whereas the increased death-rate of males aged 35—75, and of females aged 55—75, are simple facts, and therefore easily comprehended, the other fact that a larger proportion of those born survive to the useful ages is not so easily measured and appreciated. Let us therefore now, with the help of the figures in Table VII, consider the increase in the numbers of survivors at different ages, due to the recent decline in the death-rate. Of each 1,000 males born, forty-four more attain the age of 35 according to the Life Table of 1876-80 than by the previous Table of 1838-54.

Notwithstanding the slight increase of mortality among males aged 35 and upwards, a large proportion of these additional forty-four survivors live on to the higher ages. Of the 1,000 born the additional number of survivors is thirty-five at age 45, twenty-six at age 55, nine at 65, three at 75, and one at 85. This clearly proves that the gain to human life is not confined to childhood and youth. Although males over 35 years die at a somewhat higher rate than formerly, the marked decline in the death-rates up to that age causes such an addition to the number of survivors above that age, as materially to increase the number of years lived at all the subsequent ages.

The increase in the number of survivors to adult and middle ages is of course much larger among females than among males, owing to the much greater decline in the death-rate of females. Thus of 1,000 females born, sixty-one more attain the age of 45 by the Life Table of 1876-80 than by that of 1838-54. The additional survivors among females, by the more recent Life Table, are fifty-seven at age 55, forty at 65, twenty-one at 75, and six at 85. These figures show in a conclusive manner that much larger proportions both of males and females now survive to and live through the useful adult ages than survived thirty years ago.

The figures in Tables VIII, IX, and X show the numbers and proportions of years lived by 1,000 infants born, subject respectively to the death-rates of 1838-54 and 1876-80; 1,000 males would live 39.915 years according to the Life Table of 1838-54, and 41.924 years according to that of 1876-80. Thus the reduced death-rates of 1876-80 would give the 1,000 males born an aggregate increase of 2,009 years of life. It is however important for our purpose to ascertain at what groups of ages these additional years are lived.

The "Spectator" asked, "Are we young longer, or mature 'longer, or old longer?'" In order to supply a rejoinder, if not a reply to this inquiry, we need to know at what periods of life these additional years are lived. Although a large proportion of young people cease to be dependent before 20, and a large proportion of elderly persons do not become dependent at 60, we shall not be far wrong in classing the forty years from 20—60 as the useful period of man's life. Table IX shows us that of the 2,009 years added to the lives of 1,000 males by the reduction of the death-rate in 1876-80, no less than 1,407, or 70 per cent., are lived at the useful ages between 20 and 60. Of the remainder of the increase, 445, or 22 per cent., are lived under 20 years, and 157, or 8 per cent., above 60 years. Thus of the total increase 70 per cent. is added to the useful, and 30 per cent. to what may be called the dependent age periods.

The increased number of years lived by 1,000 females, according to the rates of mortality that prevailed in 1876-80, is 3,405. Of these (see Table X) 2,196, or 65 per cent., are lived at the useful ages between 20 and 60; 517, or 15 per cent., under 20 years of age, and 692, or 20 per cent., over 60 years.

Taking 1,000 persons of the usual sex proportions, we find (see Table VIII) that the increase of years lived is 2,699, of which 1,796, or 66 per cent., are lived at the useful period 20—60, 482, or 18 per cent., under 20 years; and 421, or 16 per cent., above 60 years.

These figures not only prove beyond doubt, the marked addition to life in England which will be caused by a continuance of the low death-rates that prevailed between 1876-80; they further show that by far the largest proportions of the years added to human life in England, both of males and of females, are lived at those ages when the value of life to the community is greatest.

When we consider that nearly 900,000 births occur annually in England and Wales, and that the effect of this reduction in the death-rate signifies the addition of 900 times 2,699 years of life to the lifetime of the English people each year; and further, that 66 per cent. of these years of added life are lived at the useful

age period 20—60, it becomes possible to realise how vast will be the national effect of this reduction in the death-rate.

It would be impossible within the limits of this paper to attempt to discuss the causes that have most largely contributed to the changes that have recently taken place in the English death-rate, namely, the marked decline in childhood and youth, and the small increase in middle life. Dr. Rabagliati attributes the former mainly to the decreased fatality of zymotic disease, and the latter to the increase of anxiety and worry arising from intensified competition and struggle for existence. There is probably much truth in these assertions, but further investigation would very likely show that decrease of zymotic fatality accounts for only a portion of the marked decline in the English death-rate of males between 5 and 35, and of females between 5 and 45 years of age. We cannot implicitly accept Dr. Rabagliati's assertion that if zymotic diseases be excluded, human life can be shown to have actually shortened in recent years. Assuming, however (what is probably to a great extent true), that the lowered death-rate and the increased duration of life that we have been discussing, are in great measure due to the reduced fatality of zymotic disease, these changes are none the less a national gain. Moreover, we doubt if Dr. Rabagliati has taken sufficiently into account the fact that if children be spared from the ravages of these preventable diseases of youth, one of the natural results of their survival is to render them liable in after years to the diseases incidental to adult life. This subject is, however, beyond the scope of the present paper.

VI.—*Conclusion.*

It may be useful before closing this paper briefly to re-state one or two facts which appear to have been established by the new Life Table, and the deductions therefrom.

(1.) The death-rate of males in 1876-80 showed a decline at each of the twelve age periods dealt with by the Registrar-General, except the four decennials 35—75, when there was an increase; and that the decline was equal to from 28 to 32 per cent. at each quinquennial of the twenty years 5—25.

The death-rate of females showed a still larger decline than that of males, and the decline was shown at each group of ages except those of the twenty years 55—75. The decline between 5 and 35 years ranged from 24 to 35 per cent.

(2.) The effect of this decline in the death-rate, measured by the Life Table method, is to raise the mean duration of life among males from 39·9 years, as shown by Dr. Farr's English Life Table (based upon the mortality in the seventeen years 1838-54) to 41·9 years: thus adding an average of two years to the life of each male born in

England and Wales. The mean duration of female life, which was 41·9 by Dr. Farr's Table, is raised to 45·3 by the new Table, showing an average gain of nearly three and a half years to the life time of every female born.

(3.) Thus the increase of mortality in adult life is more than counterbalanced, as regards its effect upon the mean duration of life, by the larger proportion of children and young persons who now survive to adult or middle life.

(4.) By far the larger proportion of the increased duration of human life in England is lived at useful ages, and not at the dependent ages either of childhood or old age. Among males 70 per cent., and among females 65 per cent., of the increased duration of life is lived between the ages of 20 and 60 years.

It may be hoped that these conclusions will tend to the formation of a sounder and fuller appreciation of the national value of the recent decline in the death-rate. They should also, by showing the effect of recent sanitary progress upon the death-rate, serve to strengthen the hands of sanitary authorities, and of medical officers of health, in their struggle against the vast amount of apathy still existing in health matters. Medical Officers of Health of large towns would find the Life Table method described in this paper useful for displaying in an effective manner the amount of the waste of life still taking place in our urban populations.

TABLE I.—*Annual Rates of Mortality per Thousand of Males in England and Wales, during each Quinquenniad of the Forty Years 1841-80, at Twelve Groups of Ages.*

Ages.	1841-45.	1846-50.	1851-55.	1856-60.	1861-65.	1866-70.	Mean Rates in Thirty Years 1841-70.	1871-75.	1876-80.
All ages	22·2	24·0	23·5	22·7	23·7	23·7	23·3	23·3	22·2
0—5....	68·8	73·6	74·0	71·6	74·1	72·9	72·5	70·0	67·2
5—10....	8·8	9·5	8·8	8·3	8·5	7·9	8·6	7·2	6·4
10—15....	4·8	5·4	5·1	4·6	4·7	4·3	4·8	4·0	3·5
15—20....	6·8	7·3	7·0	6·4	6·4	6·0	6·7	5·7	5·0
20—25....	9·0	10·0	9·2	8·4	8·7	8·3	8·9	8·1	6·8
25—35....	9·4	10·5	10·0	9·2	9·7	10·1	9·8	10·1	8·7
35—45....	12·2	13·5	12·9	12·2	13·2	13·8	13·0	14·3	13·5
45—55....	17·3	19·2	18·6	17·5	18·9	19·5	18·5	20·1	19·0
55—65....	30·4	33·2	31·6	30·5	32·8	33·5	32·0	34·7	34·6
65—75....	65·6	69·5	66·7	64·4	66·4	67·8	66·7	69·4	67·6
75—85....	143·7	152·6	150·8	142·7	145·9	148·6	147·4	148·0	146·7
85 and upwds.	304·7	318·4	310·9	305·9	316·4	313·0	311·6	315·0	304·1

TABLE II.—*Annual Rates of Mortality of Females in England and Wales, during each Quinquenniad of the Forty Years 1841-80, at Twelve Groups of Ages.*

Ages.	1841-45.	1846-50.	1851-55.	1856-60.	1861-65.	1866-70.	Mean Rates in Thirty Years 1841-70.	1871-75.	1876-80.
All ages	20.6	22.5	21.8	21.0	21.5	21.2	21.4	20.7	19.5
0—5....	58.6	63.6	63.9	62.4	64.2	63.3	62.7	60.0	57.0
5—10....	8.6	9.2	8.5	8.3	8.3	7.4	8.4	6.6	6.0
10—15....	5.2	5.7	5.3	4.8	4.8	4.3	5.0	4.0	3.6
15—20....	7.6	8.1	7.8	7.1	6.9	6.4	7.3	6.0	5.1
20—25....	8.6	9.5	8.9	8.3	8.2	7.8	8.6	7.5	6.3
25—35....	9.9	11.2	10.3	9.6	9.8	9.6	10.1	9.2	7.9
35—45....	12.2	13.6	12.6	11.9	12.0	12.1	12.4	12.0	11.2
45—55....	15.1	16.9	15.8	14.8	15.5	15.8	15.7	15.8	14.9
55—65....	27.2	29.7	27.8	26.5	27.9	27.9	27.8	28.8	28.9
65—75....	59.2	62.7	59.7	58.1	59.1	59.1	59.7	61.0	60.2
75—85....	132.0	139.8	137.1	132.0	133.7	136.1	135.1	134.3	132.3
85 and upwds. }	288.3	296.8	291.8	286.1	287.8	282.0	288.8	285.9	274.0

TABLE III.—*Mean Annual Mortality of Males and Females in England and Wales in Seventeen Years 1838-54, and in Five Years 1876-80.*

Groups of Ages.	Males.			Females.		
	Mean Annual Death-Rate per 1,000 Living.		Increase or Decrease per Cent.	Mean Annual Death-Rate per 1,000 Living.		Increase or Decrease per Cent.
	1838-54.	1876-80.		1838-54.	1876-80.	
All ages	23.25	22.16	— 4.676	21.64	19.54	— 9.685
0—5.....	72.25	67.20	— 6.986	62.13	57.02	— 8.224
5—10.....	9.19	6.44	— 29.955	8.93	5.98	— 33.030
10—15.....	5.16	3.50	— 32.155	5.49	3.56	— 35.203
15—20.....	7.11	4.96	— 30.199	7.95	5.14	— 35.322
20—25.....	9.46	6.84	— 27.732	9.05	6.30	— 30.364
25—35.....	12.86	8.70	— 12.949	10.49	7.94	— 24.296
35—45.....	9.99	13.48	+ 4.783	12.79	11.22	— 12.303
45—55.....	18.29	18.96	+ 3.640	15.96	14.94	— 6.384
55—65.....	31.74	34.64	+ 9.133	28.16	28.86	+ 2.469
65—75.....	66.80	67.60	+ 1.198	59.82	60.16	+ 0.562
75—85.....	147.36	146.72	— 0.434	134.46	132.26	— 1.635
85 and upwards	308.21	304.08	— 1.339	288.16	273.98	— 4.922

TABLE IV.—English Life Table, based on Mortality in Five Years
1876-80. MALES.

Cols. ...	1	2	3	4	5	6
x	$m_x =$ Annual Mortality at each Year of Age.		$p_x =$ Probability of Living One Year from each Age.	$l_x =$ Numbers Born and Living at each Age.	$P_x =$ Mean Numbers Living in each Year of Age.	$Q_x =$ Years which the Males at each Age will Live.
	English Life Table.	Corrected for Years 1876-80.				
0	·18326	·17046	·84293	509,208	469,218	21,347,889
1	·06680	·06213	·93974	429,227	416,294	20,878,671
2	·03624	·03371	·96685	403,361	396,675	20,462,377
3	·02416	·02247	·97778	389,990	385,657	20,065,702
4	·01799	·01673	·98341	381,324	378,161	19,680,045
5	·01369	·00959	·99046	374,998	373,210	19,301,884
6	·01088	·00762	·99241	371,421	370,011	18,928,674
7	·00920	·00644	·99358	368,602	367,419	18,558,663
8	·00767	·00537	·99464	366,235	365,253	18,191,244
9	·00649	·00455	·99546	364,272	363,445	17,825,991
10	·00563	·00382	·99619	362,618	361,928	17,462,546
11	·00507	·00344	·99657	361,237	360,617	17,100,618
12	·00478	·00324	·99677	359,998	359,417	16,740,001
13	·00472	·00320	·99681	358,835	358,262	16,380,584
14	·00486	·00330	·99671	357,690	357,102	16,022,322
15	·00519	·00362	·99639	356,513	355,869	15,665,220
16	·00564	·00394	·99607	355,226	354,528	15,309,351
17	·00622	·00434	·99567	353,830	353,064	14,954,823
18	·00688	·00480	·99521	352,298	351,455	14,601,759
19	·00759	·00530	·99471	350,611	349,683	14,250,304
20	·00832	·00601	·99401	348,756	347,712	13,900,621
21	·00850	·00614	·99388	346,667	345,606	13,552,909
22	·00868	·00627	·99375	344,546	343,469	13,207,303
23	·00886	·00640	·99362	342,392	341,300	12,863,834
24	·00903	·00653	·99349	340,208	339,101	12,522,534
25	·00920	·00801	·99202	337,993	336,644	12,183,433
26	·00938	·00817	·99186	335,296	333,931	11,846,789
27	·00955	·00831	·99172	332,566	331,190	11,512,858
28	·00974	·00848	·99156	329,813	328,421	11,181,668
29	·00993	·00864	·99140	327,029	325,623	10,853,247
30	·01013	·00882	·99122	324,217	322,793	10,527,624
31	·01034	·00900	·99104	321,370	319,931	10,204,831
32	·01056	·00919	·99085	318,491	317,033	9,884,900
33	·01080	·00940	·99064	315,576	314,100	9,567,867
34	·01105	·00962	·99043	312,623	311,127	9,253,767
35	·01133	·01187	·98820	309,631	307,804	8,942,640
36	·01162	·01218	·98789	305,977	304,124	8,634,836
37	·01194	·01251	·98757	302,272	300,394	8,330,712
38	·01229	·01288	·98720	298,515	296,604	8,030,318
39	·01265	·01326	·98683	294,694	292,753	7,733,714
40	·01306	·01368	·98641	290,812	288,836	7,440,961
41	·01348	·01412	·98598	286,860	284,849	7,152,125
42	·01394	·01461	·98550	282,838	280,788	6,867,276
43	·01444	·01513	·98498	278,737	276,644	6,586,488
44	·01497	·01569	·98443	274,551	272,413	6,309,844
45	·01554	·01611	·98402	270,276	268,117	6,037,431
46	·01615	·01674	·98340	265,957	263,749	5,769,314
47	·01680	·01741	·98274	261,542	259,285	5,505,565
48	·01749	·01813	·98203	257,028	254,719	5,246,280
49	·01823	·01889	·98129	252,409	250,047	4,991,561

TABLE IV (Contd.).—*English Life Table, Five Years 1876-80. MALES.*

Cols. ...	1	2	3	4	5	6
<i>x</i>	$m_x =$ Annual Mortality at each Year of Age.		$p_x =$ Probability of Living One Year from each Age.	$l_x =$ Numbers Born and Living at each Age.	$P_x =$ Mean Numbers Living in each Year of each Age.	$Q_x =$ Years which the Males at each Age will Live.
	English Life Table.	Corrected for Years 1876-80.				
50	·01902	·01971	·98048	247,686	245,269	4,741,514
51	·02042	·02116	·97906	242,852	243,309	4,496,245
52	·02145	·02223	·97801	237,766	235,152	4,255,936
53	·02251	·02333	·97694	232,538	229,857	4,020,784
54	·02364	·02450	·97580	227,175	224,426	3,790,927
55	·02485	·02712	·97324	221,678	218,712	3,566,501
56	·02617	·02856	·97184	215,746	212,708	3,347,789
57	·02763	·03015	·97030	209,670	206,557	3,135,081
58	·02925	·03192	·96858	203,443	200,247	2,928,524
59	·03105	·03389	·96667	197,051	193,767	2,728,277
60	·03305	·03607	·96457	190,483	187,108	2,534,510
61	·03529	·03851	·96222	183,734	180,264	2,347,402
62	·03777	·04122	·95961	176,793	173,222	2,167,138
63	·04053	·04423	·95673	169,652	165,982	1,993,916
64	·04360	·04758	·95353	162,311	158,540	1,827,934
65	·04698	·04754	·95356	154,769	151,175	1,669,394
66	·05071	·05132	·94996	147,581	143,888	1,518,219
67	·05483	·05549	·94601	140,196	136,412	1,374,331
68	·05933	·06004	·94171	132,627	128,761	1,237,919
69	·06425	·06502	·93703	124,896	120,964	1,109,158
70	·06962	·07045	·93195	117,032	113,050	988,194
71	·07545	·07635	·92646	109,068	105,058	875,144
72	·08176	·08274	·92055	101,047	97,033	770,086
73	·08861	·08967	·91418	93,019	89,027	673,053
74	·09599	·09714	·90736	85,036	81,097	584,026
75	·10391	·10346	·90163	77,158	73,363	502,929
76	·11246	·11197	·89397	69,568	65,880	429,566
77	·12158	·12105	·88586	62,192	58,643	363,686
78	·13136	·13079	·87724	55,093	51,711	305,043
79	·14178	·14116	·86815	48,330	45,141	253,332
80	·15290	·15224	·85853	41,958	38,990	208,188
81	·16474	·16403	·84840	36,022	33,292	169,198
82	·17726	·17649	·83782	30,561	28,083	135,906
83	·19057	·18974	·82670	25,605	23,386	107,823
84	·20471	·20382	·81503	21,167	19,209	84,437
85	·21966	·21672	·80447	17,252	15,566	65,228
86	·23529	·23214	·79200	13,879	12,435	49,662
87	·25196	·24859	·77889	10,992	9,777	37,227
88	·26947	·26586	·76533	8,562	7,557	27,450
89	·28799	·28413	·75121	6,552	5,737	19,593
90	·30717	·30306	·73682	4,922	4,275	14,156
91	·32764	·32325	·72173	3,627	3,122	9,881
92	·34897	·34430	·70627	2,618	2,234	6,759
93	·37139	·36642	·69032	1,849	1,562	4,525
94	·39430	·38902	·67433	1,276	1,069	2,963
95	·42035	·41472	·65651	861	713	1,894
96	·44444	·43849	·64036	565	463	1,181
97	·47312	·46678	·62155	362	294	718
98	·50000	·49331	·60429	225	180	424
99	·53398	·52683	·58301	136	108	244
100	·55000	·54264	·57317	79	62	136*

* This number shows how many years the 79 males who attain the age of 100 years will live, calculated by the English Life Table, No. 3.

TABLE V.—*English Life Table, based on Mortality in Five Years*
1876-80. FEMALES.

Cols. ...	1	2	3	4	5	6
x	$m_x =$ Annual Mortality at each Year of Age.		$p_x =$ Probability of Living One Year from each Age.	$l_x =$ Numbers Born and Living at each Age.	$P_x =$ Mean Numbers Living in each Year of Age.	$Q_x =$ Years which the Females at each Age will Live.
	English Life Table.	Corrected for Years 1876-80.				
0 ...	·14749	·13536	·87322	490,792	459,681	22,209,493
1 ...	·06436	·05907	·94262	428,569	416,273	21,749,812
2 ...	·03603	·03307	·96747	403,978	397,408	21,333,539
3 ...	·02450	·02249	·97776	390,837	386,491	20,936,131
4 ...	·01785	·01638	·98375	382,145	379,040	20,549,640
5 ...	·01337	·00895	·99109	375,935	374,260	20,170,600
6 ...	·01061	·00711	·99292	372,585	371,266	19,796,340
7 ...	·00912	·00611	·99391	369,947	368,820	19,425,074
8 ...	·00771	·00516	·99485	367,694	366,748	19,056,254
9 ...	·00664	·00445	·99556	365,801	364,988	18,689,506
10 ...	·00587	·00380	·99621	364,176	363,486	18,324,518
11 ...	·00537	·00348	·99653	362,796	362,167	17,961,032
12 ...	·00512	·00332	·99669	361,537	360,939	17,598,865
13 ...	·00509	·00330	·99671	360,341	359,748	17,237,926
14 ...	·00524	·00340	·99661	359,155	358,546	16,878,178
15 ...	·00556	·00360	·99641	357,938	357,296	16,519,632
16 ...	·00601	·00389	·99612	356,653	355,961	16,162,336
17 ...	·00658	·00426	·99575	355,269	354,514	15,806,375
18 ...	·00721	·00466	·99535	353,759	352,936	15,451,861
19 ...	·00789	·00510	·99491	352,114	351,218	15,098,925
20 ...	·00860	·00599	·99403	350,322	349,276	14,747,707
21 ...	·00882	·00614	·99388	348,230	347,165	14,398,431
22 ...	·00904	·00630	·99372	346,099	345,012	14,051,266
23 ...	·00925	·00644	·99358	343,926	342,822	13,706,254
24 ...	·00946	·00659	·99343	341,718	340,596	13,363,432
25 ...	·00966	·00731	·99272	339,473	338,237	13,022,836
26 ...	·00985	·00746	·99257	337,001	335,749	12,684,599
27 ...	·01005	·00761	·99242	334,497	333,229	12,348,850
28 ...	·01024	·00775	·99228	331,962	330,681	12,015,621
29 ...	·01043	·00790	·99213	329,399	328,103	11,684,940
30 ...	·01063	·00805	·99198	326,807	325,496	11,356,837
31 ...	·01082	·00819	·99184	324,186	322,863	11,031,341
32 ...	·01102	·00834	·99169	321,540	320,204	10,708,478
33 ...	·01123	·00850	·99154	318,868	317,520	10,388,274
34 ...	·01143	·00865	·99139	316,171	314,809	10,070,754
35 ...	·01165	·01022	·98983	313,448	311,855	9,755,945
36 ...	·01186	·01040	·98965	310,261	308,655	9,444,090
37 ...	·01210	·01061	·98945	307,049	305,429	9,135,435
38 ...	·01234	·01082	·98924	303,810	302,176	8,830,006
39 ...	·01259	·01104	·98902	300,541	298,891	8,527,830
40 ...	·01285	·01127	·98879	297,241	295,575	8,228,939
41 ...	·01313	·01151	·98856	293,909	292,228	7,933,364
42 ...	·01341	·01176	·98831	290,547	288,848	7,641,136
43 ...	·01371	·01202	·98805	287,150	285,435	7,352,288
44 ...	·01403	·01230	·98778	283,719	281,985	7,066,853
45 ...	·01437	·01345	·98664	280,252	278,350	6,784,868
46 ...	·01473	·01379	·98630	276,508	274,614	6,506,488
47 ...	·01510	·01414	·98596	272,719	270,804	6,231,874
48 ...	·01549	·01450	·98560	268,894	266,954	5,961,070
49 ...	·01591	·01489	·98522	265,018	263,060	5,694,116

TABLE V (Contd.).—English Life Table, Five Years 1876-80. FEMALES.

Cols. ...	1	2	3	4	5	6
x	$m_x =$ Annual Mortality at each Year of Age.		$p_x =$ Probability of Living One Year from each Age.	$l_x =$ Numbers Born and Living at each Age.	$P_x =$ Mean Numbers Living in each Year of Age.	$Q_x =$ Years which the Females at each Age will Live.
	English Life Table.	Corrected for Years 1876-80.				
50	·01634	·01530	·98482	261,101	259,119	5,431,056
51	·01680	·01573	·98439	257,138	255,131	5,171,937
52	·01729	·01619	·98394	253,124	251,092	4,916,806
53	·01780	·01666	·98348	249,059	247,001	4,665,714
54	·01987	·01860	·98157	244,944	242,687	4,418,713
55	·02120	·02172	·97851	240,430	237,847	4,176,026
56	·02259	·02315	·97711	235,263	232,570	3,938,179
57	·02407	·02466	·97564	229,878	227,078	3,705,609
58	·02566	·02629	·97405	224,278	221,368	3,478,531
59	·02738	·02806	·97233	218,458	215,436	3,257,163
60	·02927	·02999	·97045	212,413	209,275	3,041,727
61	·03134	·03211	·96840	206,137	202,880	2,832,452
62	·03362	·03445	·96613	199,623	196,242	2,629,572
63	·03614	·03703	·96364	192,862	189,356	2,433,330
64	·03891	·03987	·96091	185,849	182,216	2,243,974
65	·04198	·04222	·95865	178,584	174,892	2,061,758
66	·04535	·04560	·95542	171,200	167,384	1,886,866
67	·04906	·04934	·95185	163,568	159,630	1,719,482
68	·05314	·05344	·94795	155,692	151,640	1,559,852
69	·05760	·05792	·94371	147,588	143,434	1,408,212
70	·06247	·06282	·93909	139,280	135,039	1,264,778
71	·06778	·06816	·93409	130,797	126,486	1,129,739
72	·07355	·07396	·92868	122,176	117,819	1,003,253
73	·07980	·08025	·92285	113,462	109,086	885,434
74	·08659	·08708	·91655	104,709	100,340	776,348
75	·09389	·09235	·91173	95,971	91,735	676,008
76	·10175	·10009	·90468	87,499	83,329	584,273
77	·11024	·10844	·89714	79,159	75,088	500,944
78	·11930	·11735	·88915	71,017	67,081	425,856
79	·12903	·12692	·88065	63,145	59,376	358,775
80	·13942	·13714	·87166	55,608	52,040	299,399
81	·15048	·14802	·86218	48,471	45,131	247,359
82	·16227	·15962	·85218	41,791	38,702	202,228
83	·17483	·17197	·84165	35,614	32,794	163,526
84	·18812	·18504	·83063	29,974	27,436	130,732
85	·20227	·19231	82456	24,897	22,713	103,296
86	·21716	·20647	·81285	20,529	18,608	80,583
87	·23292	·22146	·80062	16,687	15,023	61,975
88	·24960	·23731	·78786	13,360	11,943	46,952
89	·26726	·25411	·77454	10,526	9,340	35,009
90	·28564	·27158	·76089	8,153	7,178	25,669
91	·30521	·29019	·74658	6,203	5,417	18,491
92	·32579	·30975	·73179	4,631	4,010	13,074
93	·34725	·33016	·71662	3,389	2,909	9,064
94	·36935	·35117	·70128	2,429	2,066	6,155
95	·39338	·37402	·68491	1,703	1,435	4,080
96	·41873	·39812	·66797	1,167	973	2,654
97	·44397	·42212	·65145	779	643	1,681
98	·47333	·45003	·63263	508	415	1,038
99	·49730	·47282	·61759	321	259	623
100	·53153	·50537	·59657	198	158	364*

* This number shows how many years the 198 females who attain the age of 100 years will live, calculated by the English Life Table, No. 3.

TABLE VI.—*Mean After-lifetime (Expectation of Life) at Various Ages, from Life Tables, based upon English Mortality in 1838-54 and 1876-80.*

Ages.	Persons.		Males.		Females.	
	1838-54.	1876-80.	1838-54.	1876-80.	1838-54.	1876-80.
0	40·86	43·56	39·91	41·92	41·85	45·25
5	50·02	52·56	49·71	51·47	50·33	53·65
10	47·36	49·24	47·05	48·16	47·67	50·32
15	43·54	45·05	43·18	43·94	43·90	46·15
20	39·88	40·98	39·48	39·86	40·29	42·10
25	36·57	37·21	36·12	36·05	37·04	38·36
35	29·99	30·01	29·40	28·88	30·59	31·12
45	23·41	23·29	22·76	22·34	24·06	24·21
55	16·94	16·75	16·45	16·09	17·43	17·37
65	11·17	11·19	10·82	10·79	11·51	11·55
75	6·72	6·81	6·49	6·52	6·93	7·04
85 and upwards	3·87	4·00	3·73	3·78	3·98	4·15

TABLE VII.—*Of One Thousand Born, the Numbers of Survivors at Different Ages, calculated from Life Tables Based upon English Mortality in 1838-54 and in 1876-80.*

Ages.	Persons.		Males.		Females.	
	1838-54.	1876-80.	1838-54.	1876-80.	1838-54.	1876-80.
Number born	1000·0	1000·0	1000·0	1000·0	1000·0	1000·0
5	736·8	750·9	723·7	736·4	750·6	766·0
10	702·5	726·8	689·9	712·1	715·8	742·0
15	684·6	714·5	672·8	700·1	696·9	729·3
20	662·8	699·1	651·9	684·9	674·1	713·8
25	634·0	677·5	624·2	663·8	644·3	691·7
35	572·0	623·1	564·4	608·1	579·9	638·7
45	502·9	550·5	495·8	530·8	510·4	571·0
55	421·1	462·1	409·5	435·3	433·3	489·9
65	309·0	333·4	294·6	303·9	324·2	363·9
75	161·1	173·1	148·1	151·5	174·8	195·5
85	38·6	42·1	33·0	33·9	44·4	50·7
95	2·2	2·6	1·6	1·7	2·7	3·5

TABLE VIII.—*Synopsis of the Lifetime of One Thousand Persons, calculated from Life Tables based upon English Mortality in 1838-54 and in 1876-80.*

Ages.	Years Lived according to English Life Tables.		Increase according to Recent Life Table.		Percentage of Years Lived at each Group of Ages according to Life Tables.	
	1838-54.	1876-80.	Years.	Percentage.	1838-54.	1876-80.
All ages.....	40,858	43,557	2,699	100	100·0	100·0
0—20	14,427	14,909	482	18	35·3	34·2
20—60	21,276	23,072	1,796	66	52·1	53·0
60 and upwards...	5,155	5,576	421	16	12·6	12·8

TABLE IX.—*Synopsis of the Lifetime of One Thousand Males, calculated from Life Tables based upon English Mortality in 1838-54 and in 1876-80.*

Ages.	Years Lived according to English Life Tables.		Increase according to Recent Life Table.		Percentage of Years Lived at each Group of Ages according to Life Tables.	
	1838-54.	1876-80.	Years.	Percentage.	1838-54.	1876-80.
All ages.....	39,915	41,924	2,009	100	100·0	100·0
0—20	14,180	14,625	445	22	35·5	34·9
20—60	20,915	22,322	1,407	70	52·4	53·2
60 and upwards...	4,820	4,977	157	8	12·1	11·9

TABLE X.—*Synopsis of the Lifetime of One Thousand Females, calculated from Life Tables based upon English Mortality in 1838-54 and in 1876-80.*

Ages.	Years Lived according to English Life Tables.		Increase according to Recent Life Table.		Percentage of Years Lived at each Group of Ages according to Life Tables.	
	1838-54.	1876-80.	Years.	Percentage.	1838-54.	1876-80.
All ages.....	41,847	45,252	3,405	100	100·0	100·0
0—20	14,686	15,203	517	15	35·1	33·6
20—60	21,655	23,851	2,196	65	51·7	52·7
60 and upwards...	5,506	6,198	692	20	13·2	13·7

DISCUSSION *on* MR. HUMPHREYS'S PAPER.

THE PRESIDENT before the reading of the paper stated: Before we proceed to the reading of the paper, I think it is our duty to commemorate the loss which the Society has just sustained in the death of Dr. Farr. Dr. Farr has been for many years identified with the Society, and was one of the most eminent, if not perhaps the most eminent member, as a pure statistician, that we have ever had. His membership dates not quite from the beginning of the Society, but from a very early period after its formation; and not only in connection with it, but in his official capacity, he has done perhaps the greatest service of any one statistician of our time to the cause of statistics in this country. I am quite sure that on this occasion we, as a Society, ought to acknowledge in the fullest manner the very great service which Dr. Farr has rendered. The work which he has done officially, in the way of giving us good statistics of births, deaths, and marriages, the vital statistics of the country, and the way in which he took advantage of his official position to point out the causes which were productive of great mortality amongst his countrymen, and to indicate the remedial measures which were necessary, are sufficient in themselves to prove that he has performed one of the most useful works which any official of the country could possibly have performed. The papers which he contributed to this Society were very numerous, and not many years ago we remember that very elaborate paper upon the valuation of stocks and shares which had only a deferred value, not one of the usual subjects with which he occupied himself, indeed somewhat apart from them, but still a paper which his mathematical and other acquirements rendered of the greatest value. I think also in commemorating the great loss we have sustained, we ought to remember that Dr. Farr had not only a reputation in this country, but a very wide reputation abroad, and that the methods which he introduced have been very widely imitated. He has done great service to statistical science, not only in this country, but everywhere where statistics have been studied. Personally we have all the utmost occasion to lament the loss which we have sustained. Dr. Farr's character, as you all know, was one of the most amiable. He was one of the most cheerful companions that we could have, and I am sure that we must all regret the causes which have prevented his appearance at our meetings for several years, and which at last have led to his death at what is really a considerable age, but at an age which for him is almost untimely, because it was so recently that he was doing good work, and now he is almost suddenly taken away. To follow the precedent adopted when Mr. Newmarch died, I should like to propose that the Council be requested to send a letter of condolence in proper form to the family of Dr. Farr, expressing the regret of the Society at the loss which

they have sustained, and our sympathy with them in their bereavement.

Sir RAWSON W. RAWSON: It is very seldom that one has reason to be glad of the privilege of claiming age as a reason for offering an observation. I regret that age has put me in that position; but as one of the oldest members of the Society, and, I believe, the oldest member who is officially connected with the Society, having been one of the Honorary Secretaries within two years after its formation, I rise to second the proposition that our President has, in sufficient and appropriate language, offered for our acceptance. Personally, I have been separated from Dr. Farr for thirty years, in spirit I have never been separated. I have a very strong feeling of regret at the loss of a friend, and a man whom I highly esteemed, and I believe that that feeling is universal in the Society. I therefore have the greatest pleasure in rising to second the resolution, that we should request the Council to express not only their own feeling, which might be expected, but the feeling of the whole Society, of regret at the loss of a most valuable member, a most valuable public officer, and a man who has set an example of devotion to scientific pursuits tending to benefit mankind, which, I hope, a number here present are prepared to imitate.

(The Paper having been read),

Dr. J. MORTIMER GRANVILLE said, if there was any occasion on which he should be sorry to be regarded by this Society as a representative of those who disbelieved both in death-rates and in sanitation, it would be at a time when they had just sustained so serious a loss as that involved in the death of Dr. Farr. It was undoubtedly to him that they owed, if not in detail and fact, at any rate in principle, the calculation of death-rates, and in truth the whole system of vital statistics, for the impetus which his enterprise gave to the study of this branch of statistical science in England, was undoubtedly the foundation of all that had since been done and probably would be done in future. He confessed when he saw Mr. Humphreys's paper he felt being very much in the position of one overtaken by Nemesis. He had entirely forgotten the letter which he wrote to the *Spectator*, and although a man was responsible for whatever he had written at any period of his life, he felt exceedingly inclined to fall back on the aphorism of a statesman whose memory he cherished, and to say that "many things have happened since then." So far as he remembered the argument, his contention was that unless it could be shown that a majority of the persons living at a particular period belonged to an age which Mr. Humphreys had described as the "age of usefulness," it would be no great gain to the population or to humanity, as a whole, to say that the duration of life had been increased. Mr. Humphreys had probably seen a paper which he wrote in the *Nineteenth Century* in March, 1879, in which he contended that owing to the entire omission of the question of age in the returns of lunatics, a great mistake had been made, and that a large proportion of the alleged and apparent "increase of insanity" was actually due to the mode

of returning adopted, namely, taking the total of the insane population at one period and then at another, and calculating the difference between the two as an increase or decrease. By that process they got an apparent increase of 13·70 in about thirty years, whereas by taking out the actual differences for age, it was reduced to something like 1·49. Mr. Humphreys took the question of age as the foundation of the whole of his argument, and he seemed to say that although there was between the periods of 20 and 60 an increased proportion of persons living, yet the expectation of life between those periods gradually fell. It would almost seem that he had got an apparent increase of longevity during that time by comparing the earlier part of the period soon after 20 and the later part of the period not far before 60. If that was so, the middle part of the period, where the ages ranged from 45 to 60, did not show a very satisfactory state of things. By taking so large a period as between 20 and 60, it seemed that the real question was, at any rate to a certain extent, begged. The point which he (Dr. Granville) was anxious to insist upon was this: They had come to regard the mere prolongation of life as so very important a matter, and so disconnected it from the absolute question of age in relation to usefulness, that the whole question of gain was a little qualified; while in regard to sanitation it certainly did seem, taking the statistics of the Registrar-General's office, even as construed by Mr. Humphreys, that the gain was very much due to the reduction of deaths under the head of zymotic diseases. If that were so, those zymotic diseases undoubtedly were not the most important things, as regarded the destruction of human life at periods of usefulness. By taking a period from 20 to 30 and following it up to 60, stopping short at the period from 60 to 65, there was no doubt they did gain something very great indeed in the face of the figures; but looking at the matter in a practical light, the question remained, had they positively gained by the enormous expenditure of thought and attention which had been given to the question of sanitation during the last thirty years? He confessed that it appeared to him that they had not, and that he thought was a question which might be discussed with very great advantage by a Society of that class. He had never questioned the value of the work done at the Registrar-General's office with a view to the utilisation of the facts at their disposal, but he did most gravely question the value of those facts; and on this, among other grounds, that the returns made by medical men were not returns made with a view to such calculations as were made at the Registrar-General's office, the causes of death stated being in many cases sufficient for the purposes of the law, but not of any real nosological value. They were not so checked as to render them trustworthy as data available for the purpose of determining the relative prevalence of diseases. That was a point of immense importance, and when in the office of the Registrar-General they drew deductions to the effect that certain diseases were dying away, while other diseases were getting the ascendancy, and so forth, those deductions must be regarded as qualified. No one could question the Registrar-General's work, so far as the office was concerned, but as to the value of the

“statistics” which resulted, he did not think the figures were worth the paper on which they were written.

Mr. A. H. BAILEY, F.I.A., said the function of the Statistical Society was to investigate facts, and not to trouble itself with speculations as to whether we lived longer or were slower in dying. The facts for them to determine on the present occasion were simply these, what were the rates of mortality at particular periods of life? Mr. Humphreys had done very good service by calling their attention to the principle that the desideratum in these inquiries was to determine the number of annual deaths at each age which took place amongst a given number of living at the same age, and that any other method of mortality statistics was simply fallacious. Bearing that in mind, he wished to say a word or two on the great utility and value of some of these results, and why he thought some others must be accepted with caution. No doubt the returns of the number living and deaths were substantially accurate: so that they had these two elements for the solution of the problem: they had the numbers living on a particular day, and also the number of deaths in each year, so that they could in that way compare the total number of deaths with the total numbers living. Thus from Table I it appeared that the mean rate of mortality of males for thirty years, 1841-70, was 23·3 per 1,000; from 1871-74 it was exactly the same, and from 1876-80 it was 22·2, showing an improvement. But looking a little back, they found exactly the same rate for the years 1841-45, so that where, after all, was the progress that had been made? From 1845-50 the rate was 24 per 1,000. That was explained by the epidemics of cholera and influenza in that period, and, looking forward to the quinquennium 1886-90, there was no certainty that the rate would not again be raised in like manner. When, however, they came to particular ages, there were operations of greater nicety. They not merely wanted the total numbers living and dying, but the numbers living and dying at particular ages. He was very sceptical about the accuracy of the returns of ages; there were not an inconsiderable number of people who did not know their own ages, and the returns in this particular were made, he was confident, with considerable looseness. In one case which came under his notice, an Irishman was recorded as being of the age of 111. He was an old man of about 80; the recorded age was mere fancy. The other day he received a certificate of the death of a man in Lancashire, whose real age was 82, and yet the age was recorded in the certificate as 93. That was only a specimen of cases which were continually occurring in his own experience. This led him to look rather closely into this table drawn up by Mr. Humphreys, and whilst he believed implicitly that the rate of mortality of 22·2 was accurately deduced, that was to say, that the general mortality of 1876-80 corresponded with that of 1841-45, still, when he looked at particular ages, he found himself bewildered. It was well known that early manhood was a critical period of life, and from several investigations that he had made, he had come to the conclusion that the mortality of the ages

of 20 to 25 was in excess of that of the next quinquennium. But if he was to credit these results, he found that whilst the rate of mortality generally had improved from 23·3 to 22·2, the mortality at this particular period had altered from 8·9 to 6·8. According to all experience, changes in human mortality did not take place with such rapidity, so that these remarkable statements required a great deal of confirmation. He hoped it would not be supposed that he doubted the accuracy of the conclusions at which Mr. Humphreys had arrived from the facts in his possession, but he did very much doubt the facts themselves, and he should be very glad if Mr. Humphreys would give them a little more of the raw material. What they wanted was to know the numbers living at each period of age in 1881, and the actual number of deaths, so that they could draw their own conclusions.

MR. CORNELIUS WALFORD said a very great authority, the late Mr. Griffith Davies, had stated that the rate of mortality steadily decreased during the latter part of the last century and the early part of the present; but when the registrar-general's office came into operation, and the deaths came to be recorded with greater precision, it was found over a long series of years that the mortality of the country was increasing. The fact probably was that while an increased mortality was shown by the returns, there was actually no increase. What did occur was this: that the deaths which at one time were not registered, came to be registered under the new system, and in that way the returns became more correct than they had previously been; and these corrected returns had the effect of appearing to nullify the increased duration of life, which, in truth, was going on all the time. If that were so, there must be a period when the influence of corrected registration could no longer throw back or conceal the increased duration of life; and he thought it was possible that that time had arrived, during the last few years, when the returns had become so corrected that the true working of the laws of nature became disclosed. In other words, it might have been that the increasing duration of life had been in operation during the whole of the period, and that the apparent contrary result was only occasioned by the growing completeness of the returns, which was the object aimed at. There might indeed be another solution of the question. Those who had taken pains to observe the deaths arising from accidents, had seen great cycles during the generation under notice occurring in those events. In connection with accidental death, he had seen and taken note of three very marked cycles during that period, not only with regard to the increased number of accidental deaths, but with regard to the increased number resulting from certain causes; and it was possible that the increased duration of life, deduced from the decreased mortality of the last seven years, was in fact only the result of the operations of one of those cycles. There was yet another circumstance which might bear upon it: it might be that of late years the birth-rate had decreased, and then of course the death-rate would have decreased; but that would be shown by its decreasing at the earlier ages; and

the facts in the paper rather supported that idea. These were only a few of the circumstances which might possibly throw some solution upon the figures now presented. On the whole he regarded the investigation as one of very considerable interest, and he was very glad that Mr. Humphreys had brought the paper before them. No one had better opportunities of arriving at sound conclusions than that gentleman.

Mr. H. MONCREIFF PAUL said the paper would be very useful, not only to this Society, but to actuaries generally, there being a fund of thought in its general conclusions which would provide food for further investigation. Mr. Humphreys had shown that while now-a-days we start well in infancy, and, speaking broadly, got on very well up to 60 years of age, thereafter there is an increase in the mortality. The question perhaps naturally arose, was longevity coincident necessarily with the diminished death-rate, or was it otherwise? He believed it was not so: that is to say, that we might have increased the living power, or decreased the death-rate, and yet might not be able to show at the higher periods of life so large a percentage living as used to be the case. If that were so, what was the cause? There were various factors at work in modern life which undoubtedly would affect this position. In favour of longer life, they must have quiet and peace; while against it they had war, worry, and excitement. If they kept early hours they had something in favour of longevity; but against it they had late hours and night work. Then again they had temperance on the one side, ranged against drinking habits on the other; and proper exercise, as against excessive brain work without physical exercise. Increase in wealth, and consequent greater ability to procure better food and clothing, would be counteracted if greater riches were allowed to engender luxurious habits. The improved medical skill, better sanitary arrangements, and better dwellings of the present day, were important elements in counteracting the squalor and dirt of bygone times. Thus it would be seen that while many of the favourable factors were present, the unfavourable factors had not quite vanished. The question was therefore to see how best these adverse factors might be eliminated, so that yet further improvement might be attained with respect to the decline in the death-rate, and an addition be made to the duration of human life.

Mr. F. G. P. NEISON said he thought the paper was deficient in one respect. It was by no means an uncommon thing to hear the question asked, what had been the good of all the sanitary legislation that had taken place in recent years? and as one of those gentlemen who took an active part in connection with the Public Health Acts, he had always felt that there was a necessity for some public body to come forward and show that these Acts had really been the means of effecting much good in this country. Mr. Humphreys, though he knew that they had been the cause of reducing the mortality, apparently presumed that everybody was as well up in that knowledge as he was himself, for he dismissed the subject very

summarily. He regretted that Mr. Humphreys had not put a table in his paper showing the absolute increase in the urban population; for if there was one fact more certain in connection with mortality than any other, it was that it had some relation to the density of population. In 1851 the population was roughly divided into town and country. In 1861 the town population had increased to a percentage of 55, and in 1871 it had got to 62 per cent. of the total; and presumably in 1881 it would account for 70 per cent. of the whole population in England and Wales. The mortality in towns was considerably in excess of that in rural districts; and that being the case, had it not been for the effect of the Public Health Acts, it would have been impossible to retain the mortality at the rate of 23 per 1,000 of the population for each of the three last decennials. He concurred in thinking that it would have been very interesting if Mr. Humphreys had given them the data upon which his ratios had been drawn; for instance, if he had shown how much of the population in each of his quinquennial groups of years was really a town population, and how much rural, they could have better appreciated the deductions in mortality that his tables had shown. To show how great was the difference between the mortality in towns and in the counties, from several investigations made within the last few years, he had ascertained that in some towns amongst males of the ages of 35 to 45, the mortality had been as much as from 200 to 250 per cent. in excess of the mortality at the same ages in the rural districts. There was one fact in the paper that he must take objection to. Mr. Humphreys stated that the experience of the last seventeen years showed that the rate of mortality had not differed from that shown by Dr. Farr's English Life Table No. 3; but the facts shown by Mr. Humphreys's own Table No. I contradicted that statement. He also took exception to that part of the paper in which Mr. Humphreys alluded to the fact that it had not been practicable to show the population of 1881 according to the census, but that practically the proportional age distribution of the population scarcely differed from that shown in 1871; that appeared to be an inconsistency. If it was the fact that there had been a material reduction in the mortality within the last few years, surely it meant that they had more persons living during certain periods of the year than there were living proportionately ten years ago; and if that was the case, it must necessarily have the effect of altering the age distribution of the population. If Mr. Humphreys had found out that the age distribution was precisely the same, it was then an anomaly to maintain in another portion of the paper that there had been a material alteration in the rates of mortality, and yet that that alteration had not had the effect of altering the percentage of survivors at the different ages. He had occasion lately to look very closely into the fact of the influence of miasmatic diseases, and he found that within the last seven years the improvement in the rate of mortality, more particularly in connection with that section classed as typhus, typhoid, and continued fever, had been most considerable.

Sir RAWSON W. RAWSON said the observations that had fallen from

Mr. Neison were of the greatest importance to those who valued prolongation of life, and were disposed to accept the statement of the author of the paper, that the rate of mortality in England had diminished. Mr. Bailey contended that it had not diminished, because the average of all ages was the same as it was shown to be in the earlier period of 1841-45; but according to Mr. Neison's statement as to the great increase of the urban population, among whom the rate of mortality is so much higher, it ought to have been very much greater. Mr. Bailey admitted that it was stationary, and therefore according to his own showing there had been undoubtedly an improvement in the condition of the population. According to natural laws, as shown by experience, there would have been a much greater mortality in consequence of the difference in the conditions of existence among the population, if they had not been counteracted by some beneficial influences. Therefore Mr. Neison's statement confirmed by a different argument the fact asserted by the author of the paper, that there had been this considerable increase of duration of life in the average of the whole population. Dr. Granville had asked what was the value of the extension of life if it was beyond what was called "the age of usefulness?" The answer was a plain one: that there would not have been that increase if the individuals had not enjoyed a greater amount of health during the earlier years, which enabled them to reach that period of life. If they could enable a larger proportion of the population to reach an advanced age, it would be by obtaining for them an improved state of health during the earlier stages of life; and in that respect he entirely agreed with those who considered that they could not do more for the happiness of the population than by promoting their health, through well devised, completely planned, and economically executed sanitary works.

Mr. STEPHEN BOURNE said he did not feel competent to scrutinize the calculations or the arguments of the paper; but he was more inclined to see of what economical advantage such calculations were. Assuming that the figures in Table VII were correct, he found some very important results brought out. If they took the three quinquennial age-periods from 5 to 15, it would seem that the increase per cent. had been 3·2. Comparing the two periods selected, from 1838-54 and 1876-80, there was an increase of 3·2 to the numbers, leaving out all those who were born at the same age. The next periods were 7 per cent.: the next three periods showed 8·1, and the next 8. The economical result of that was this, that taking the earlier and the later periods, they found that the existing numbers had increased by 3·6; if they took the two middle periods it was 8. That was to say, embracing the periods of life when it was of economical value, they had double the increase that they had when the period of life was comparatively useless, and these must be important results to their view of the economic condition of the country. The whole question was one well worthy of their investigation, and his impression was that the results arrived at were accurate and correct, and therefore that the country was increasing in its power for production, and consequently ought,

under proper regulations, to be increasing in wealth. He was sorry to hear Dr. Granville speak so slightly of the value of certificates given by the medical men; because he should have thought that they would have been deeply interested in the prosperity of the country, and would have done their best to give full and accurate statistics. As to the ages of people being unknown, that would not very much affect the value of the calculations; because there was no reason to suppose that the variations from truth arising from ignorance were more on one side than on the other; and all those who were in the habit of dealing with very large masses of figures knew that when there was no special reason why there should be a deviation from accuracy in large results, the errors counterbalanced each other.

Mr. GEORGE HURST took exception to some remarks that had been made with regard to the term of usefulness of life, and argued that one man might become very useless at 40 years of age, whilst another at 70 years would be a very useful person. That being the case, it was wrong to put down the average of 60 as the termination of a man's usefulness. With regard to the longevity in towns, they could not rely on statistics; because a vast number of persons came to reside in towns during the best part of their lives, and then retired into the country; so that, taking it altogether, the mortality of the place might appear less than it ought to be. This would apply especially to London.

The PRESIDENT said they would all agree with him that they must give a very hearty vote of thanks to Mr. Humphreys for the paper which he had read to them. Apart from any questions which had been raised, it was of very great value that they had had recent death-rates investigated in this manner and put into the shape of a life table, enabling them to see whether there was any real improvement; that seemed to him to be the real value of the work Mr. Humphreys had done. With regard to the criticisms passed upon the data upon which the paper was founded, Dr. Granville had rather attacked the returns of the registrar-general so far as diseases were concerned. The obvious reply to that was that the greater part of the facts with which the registrar-general dealt had no connection with diseases. It might be quite true that all statistics of diseases were not to be depended upon, and yet everything that Mr. Humphreys had told them might also be quite true; for nothing that he had said had any connection with disease whatever. It ought not, therefore, to go forth that the returns of the registrar-general were untrustworthy, because some particular kind of facts which he had endeavoured to get were not to be relied upon in the way in which the primary facts were to be relied upon. With regard to the question of age, as to which Mr. Bailey was sceptical, he thought that what Mr. Bourne had said very largely answered Mr. Bailey's objection. He was not at all surprised at the facts which Mr. Bailey had brought before them, and should be quite prepared to find that all that he had told them about the improper return of ages in special cases was

quite true, and yet that those returns of ages which the registrar-general obtained were trustworthy within certain limits, so that conclusions could be drawn from them. What he should like to point out was this, that although for instance with regard to the earlier ages it was quite possible that some people as they grew up in life were very uncertain, yet with regard to younger people, the parents had an accurate knowledge as to their age; they had no motive to make incorrect returns, and the presumption was that those returns were fairly accurate. Practically no doubt according to the figures there had been a considerable improvement as regards the mortality of the country during the last thirty years, and the only two criticisms passed upon that conclusion rather tended to strengthen it. Mr. Bailey pointed out that the comparatively low rates between 1841-45 showed that there had been no improvement since that period. But apparently the returns before that time were incomplete. It would be found, looking at the figures in each quinquennium subsequently to that period, that there was a tendency to a steady decline in the death-rate beginning with 1846-50; and this was especially so looking at the deaths from 5 up to 25. The decline was comparatively steady all the way, and seemed to show that there had been some regular progress in the matter. If there was any truth in the notion that correct returns did not begin to be published until 1845, it tended very much to support the conclusion of the paper, that there had been an improvement in the mortality within recent years. Mr. Neison's criticism was a very fair one, that during the whole of the last twenty years the population had become increasingly urban, and might have been expected to show an increased rate of mortality; but as a matter of fact they found a decrease, and therefore they might be sure that the influences tending to improve the mortality of the country were extremely vigorous. To a certain extent it was too soon yet to perceive the full effect of all the changes which had been described, and he should be inclined to say that sanitary improvement was only one of the causes of the improvement in the health of the population. They ought surely to take into account that during the last thirty years the population had been better fed, and that preventive medicine was much better understood than before. These causes had not yet had full time to operate, and possibly their successors would have better materials for the discussion of the subject. It was entirely owing to the efforts made by statisticians forty or fifty years ago to introduce a correct record of facts, that they were now able to see the improvements that had taken place; but they must wait for a good many years to come before they saw the full evidence, or before all the facts could be thoroughly appreciated.

Mr. HUMPHREYS, in reply, said it was undoubtedly true, as Dr. Granville had stated, that the greatest saving of life occurred in the earlier part of the useful period; but, at the same time, every additional life that attained the useful period was so much gain. With regard to his objections to the causes of death as returned by his own profession, the general register officer was most thoroughly

alive to the imperfections of that portion of their material, and they were a source of great trouble. It was hoped, however, that by impressing upon medical men the real uses to which these facts were put, they might, in course of time, be convinced of the necessity for greater care, which would greatly add to the value of our national statistics. It was, in great measure, this very difficulty that had prevented him (Mr. Humphreys) from attempting to trace the causes of the increase of mortality among adults, which deserved serious consideration, although it did not militate very considerably against the immense advantage derived from the reduction of death-rates at earlier ages. Mr. Bailey was perfectly correct in his criticisms as to the very careless way in which ages were returned, but Mr. Bourne had sufficiently answered this objection. The ages of old persons were frequently exaggerated, but the general register office attempted to rectify this by dealing with all those aged 85 and upwards in one group. Every one might well be astonished at the very large decline of mortality amongst males from the ages of 20 to 25—a decline of 28 per cent. But there was a still larger decrease in each of the three previous periods; so that he did not think any serious source of error could be involved. The question of density was entirely distinct from the matter under discussion, and he had not attempted to deal with it. Mr. Neison referred to his statement that the age distribution at the last census did not show material change; he could only say that the census figures proved this fact. It would take a very long period of changed death-rates to alter the age distribution of a population of 26 millions. He begged, in conclusion, to return his thanks for the very complimentary way in which his paper had been received.

EDUCATION in INDIA and the INDIA COMMISSION on EDUCATION.

By the REV. JAMES JOHNSTON.

[Read before the Statistical Society, 20th March, 1883. The PRESIDENT in the Chair.]

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Introduction.

It is a hopeful sign for India, that the most engrossing subject of public interest for the greater part of last year was the education of the people. Since the month of February, when a "Commission on Education" was appointed by the Viceroy, to the end of 1882, every newspaper in India was filled with the accounts of its progress, and now the country anxiously waits for its Report. The Calcutta correspondent of the "Times" telegraphed for almost every Monday's issue a paragraph, and frequently a column of information about the work of this "Commission." We are told that "from Calcutta to Bombay," and from "Lahore to Madras, "the whole country has been stirred, and a great stimulus given to "the cause of education in all its branches, but especially in the "department of primary instruction, and more particularly to the "education of females."

To show the interest excited by the Commission in its progress through the country, for the purpose of examining each province in detail, we give two or three telegrams from the "Times:"—

“ Calcutta, 29th August.

“ The educational enthusiasm, which has recently taken so very active a form, still remains at fever pitch. At Agra, eleven addresses were presented to the president. The memorialists protested against the abolition of the Agra College, and offered to manage it by a board of trustees. The president, in reply, laid stress on the strict application to educational and medical work of the Rs. 35,000 made over to the municipality under the new decentralisation scheme. While he was in the act of speaking, a paper was delivered to him intimating that five native gentlemen had there and then subscribed Rs. 1,000 for Ripon, Lyall, and Hunter scholarships, in commemoration of his visit.

“ A large meeting was held at Allahabad, on Thursday, in the Mayo Hall, to present memorials. The meeting was crowded with natives of position. Among the Europeans present were the chief justice and the judges of the high court, the Commissioner of the division, and other officials.”

A little later he says:—

“ A profound enthusiasm has been excited in the Punjab on the subject of education. The president of the Education Commission visited Lahore by special invitation on Tuesday, and received a deputation from the nine Punjabi societies during the day. The Aujuman-i-Punjab, in the evening, presented him with an address, on which occasion five hundred natives were present. Later a *conversazione* was held, when the president delivered a long speech on the work of the Education Commission. The Commission, he said, was not hostile to the higher education, its actual work consisted in the extension of popular education.” In illustration, he stated a few facts.

Passing to the south of India, the correspondent telegraphs:—

“ The president of the Commission arrived at Madras on Tuesday, and was invited in the evening to meet the chief justice, the bishop, the president of the Municipal Commissioners, the native judge of the high court, and the leading Europeans and natives.” After mentioning the work done, he adds, “ the Commission has already rendered valuable services in stimulating educational aspirations throughout the whole course of his tour.”

I.—*The Character and Objects of the Commission.*

This Commission marks a new era in its composition, as well as by the work it has taken in hand. Its composition is unique. Not only is every province represented, each department of the many classes and races and religions of India sit side by side at its board. Native and English gentlemen who have distinguished themselves by disinterested service in the cause of education, are

associated with our professed government educationists, and Indian princes with members of the "Civil Service." Men of every creed are represented there. The Mahomedan, the Brahmin, the Parsee, the Protestant missionary, and Roman Catholic priest, work harmoniously and earnestly together, all presided over by the Hon. W. W. Hunter, a man specially fitted by natural talent and varied experience for such a post; no man in India has at once such extensive and accurate knowledge of the country, combined with such great capacity for business.

The OBJECTS for which this large and vigorous commission has been appointed are defined at length in a "resolution" of the Home Department of the Government of India, drawn up by the able hand of its secretary, the Hon. A. Mackenzie. I cannot give its twenty-three clauses, but its general aim is expressed in the following words:—"It will be the duty of the Commission to inquire particularly into the manner in which effect has been given to the principles of the despatch of 1854, and to suggest such measures as it may think desirable in order to the further carrying out of the policy therein laid down. The Government of India is firmly convinced of the soundness of that policy, and has no wish to depart from the principles upon which it is based."

The Commission is thus described in a telegram from the correspondent of the "Times," dated Calcutta, 5th February:—

"Government has resolved to appoint an imperial commission on education, consisting of twenty-one members, representing different provinces of India and classes of the community. Each local government will specially select a high educational officer on behalf of its department of public instruction, and one or more natives of rank or intellectual eminence will also attend from each province. The president will be the Hon. Mr. Hunter, who will represent in a special manner the Supreme Government and the views of the Viceroy with regard to the reforms under consideration. Among the distinguished natives will be the Hon. Maharajah Jotontro Mohun Tajore, the Hon. Bhundeb Moo, and others, on behalf of the Hindoos; and the Hon. Syed Ahmed Khan Bahadoor on behalf of the Mussulmans. Among the educational officers will be Mr. Croft, director of public instruction in Bengal; Professor Deighton, of Agra; Mr. Jacob, Bombay; and Mr. Browning, director of public instruction in the central provinces.

"The missionary societies will be strongly represented by Mr. Blaekett, Anglican, principal of the Church Missionary Society Institution; Mr. Miller, Presbyterian, principal of the Christian College, Madras; and a Roman Catholic not yet nominated." The Rev. A. Jean, D.D., has since been appointed.

The duties of the commission are well summed up by the same able hand, in the same paper, which we give in preference to our own:—

“ 1st. The duties of the Commission will be, first, to inquire “ into the action of the educational despatches from 1854 to 1868, “ and how far the educational policy prescribed by the Home “ Government has been carried out by the various local adminis- “ trations.

“ 2nd. To inquire more especially how far primary education “ has been given to the people under these despatches, and to “ suggest means whereby vernacular education can be made more “ universal.

“ 3rd. To devise means for this extension at a minimum cost “ to the State by setting free, if possible, funds which are now “ devoted to higher education, and by substituting a grant-in-aid “ for the system of direct Government support.

“ 4th. To offer every encouragement to native gentlemen to “ establish and support schools on a grant-in-aid system.

“ 5th. To ascertain how far it will be possible for the Govern- “ ment to hand over, under proper guarantees, its schools and “ colleges to bodies of native gentlemen who will undertake to “ manage them as aided institutions.

“ 6th. To endeavour to supplement the results thus obtained “ by enlisting the municipalities in the work of primary education, “ and by a large extension of the vernacular schools at the muni- “ cipal cost and under municipal control.

“ The development of indigenous schools will also form a “ special subject of inquiry. The Commission will also be directed “ to make suggestions as to the better training of teachers, the “ improvement of the present system of inspection, the extension “ of female education, and as to a more intelligent system of “ statistical returns on a uniform basis; also as to the preparation “ of a great series of text-books for use in the schools throughout “ India.

“ The first meeting will be held on Friday. The Commission “ will sit till April, when the members will disperse to their own “ duties till the next cold season. In the interval Mr. Hunter, as “ president, will visit the different provincial Governments with a “ view to studying the systems locally at work, collecting informa- “ tion on specific points, and making such local inquiries as the “ commission may deem necessary.”

II.—*The Despatch of 1854, into the Working of which Inquiry is made.*

As the great object of the Commission is to inquire into the

working of the despatch of 1854, any account of its work would be incomplete without an idea of what that great charter of education for India, as it has been well called, really is. As it is a very lengthy document, and cannot be here printed *in extenso*, I give a very brief summary of its principal features by the present Earl of Derby, written when, as Lord Stanley, he was Her Majesty's Secretary for India. In a passage from the important despatch of 1859, quoted in the *Resolution* appointing the Commission, he said, "The improvement and far wider extension of education, both English and vernacular, having been the general objects of the despatch of 1854, the means prescribed for the accomplishment of those objects were the constitution of a separate department of the administration for the work of education; the institution of universities at the several presidency towns; the establishment of training institutions for raising up teachers for the various classes of schools; the maintenance of the existing Government colleges and schools of a high order, and the increase of their number when necessary;* the establishment of additional zillah or middle schools; the increased attention to vernacular schools for elementary education, including the indigenous schools already existing throughout the country; and, finally, the introduction of a system of grants-in-aid, under which the efforts of private individuals and of local communities would be stimulated and encouraged by pecuniary grants from Government in consideration of a good secular education being afforded in the aided schools."

The following admirable summary of the despatch of 1854, taken from an official authority, is from the pen of Mr. Arthur Howell, when Secretary to the Home Department of the Government in India, and was employed by Lord Mayo to inquire into the working of that despatch in 1870, now one of the most efficient

* This refers to the time when these colleges had just been set up, and only numbered about a dozen of all kinds; now they number 183. It does not hint at any change of the line of policy laid down in the despatch of 1854 for the "transference" of those colleges to local control when the altered circumstances admitted of it, and rendered it desirable. The following is the text of the despatch on this subject:—

"Par. 62. We would look forward to a time, when any general system of education, entirely provided by the Government, may be discontinued with the gradual advance of the system of grants-in-aid, and when many of the existing Government institutions, especially those of the higher order, may be safely closed, or transferred to the management of local bodies under the control of and aided by the State; but it is far from our wish to check the spread of education in the slightest degree, by the abandonment of a single school to probable decay, and we therefore entirely confide in your discretion, and in that of the different local authorities, while keeping this object steadily in view, to act with caution, and to be guided by special reference to the peculiar circumstances which affect the demand for education in different parts of India."

members of the present Commission. This official and accurate condensation is as follows:—

“ The Indian educational code is contained in the despatches of 1854 and 1859. The main object of the former despatch is to divert the efforts of the Government from the education of the higher classes, upon whom they had up to that date been too exclusively directed, and to turn them to the wider diffusion of education among all classes of the people, and especially to the provision of primary instruction for the masses. Such instruction is to be provided by the direct instrumentality of Government, and a compulsory rate, levied under the direct authority of Government, is pointed out as the best means of obtaining funds for the purpose. The system must be extended upwards by the establishment of Government schools as models, to be superseded gradually by schools supported on the grant-in-aid principle. This principle is to be of perfect religious neutrality, defined in regular rules adapted to the circumstances of each province, and clearly and publicly placed before the natives of India. Schools, whether purely Government institutions or aided, in all of which (excepting normal schools) the payment of some fee, however small, is to be the rule, are to be in regular gradation from those which give the humblest elementary instruction to the highest colleges, and the best pupils of one grade are to climb through the other grades by means of scholarships obtained in the lower school and tenable in the higher. To provide masters, normal schools are to be established in each province, and moderate allowances given for the support of those who possess an aptness for teaching, and are willing to devote themselves to the profession of schoolmasters. By this means it is hoped that, at no distant period, institutions may be in operation in all the presidencies calculated to supply masters for all classes of schools, and thus in time greatly to limit, if not altogether to obviate, the necessity of recruiting the educational service by means of engagements made in England. The medium of education is to be the vernacular languages of India, into which the best elementary treatises in English should be translated. Such translations are to be advertised for, and liberally rewarded by Government, as the means of enriching vernacular literature. While, therefore, the vernacular languages are on no account to be neglected, the English language may be taught where there is a demand for it; but the English language is not to be substituted for the vernacular dialects of the country. The existing institutions for the study of the classical languages of India are to be maintained, and respect is to be paid to the hereditary veneration which they command. Female education is to receive

“the frank and cordial support of Government, as by it a far greater proportional impulse is imparted to the educational and moral tone of the people than by the education of men. In addition to the Government and aided colleges and schools for general education, special institutions for imparting special education in law, medicine, engineering, art, and agriculture are to receive in every province the direct aid and encouragement of Government. The agency by which this system of education is to be carried out is a director in each province, assisted by a competent staff of inspectors, care being taken that the cost of control shall be kept in fair proportion to the cost of direct measures of instruction. To complete the system in each presidency, a university is to be established, on the model of the London University, at each of the three presidency towns. These universities not to be themselves places of education, but they are to test the value of the education given elsewhere; they are to pass every student of ordinary ability who has fairly profited by the curriculum of school and college study which he has passed through, the standard required being such as to command respect without discouraging the efforts of deserving students. Education is to be aided and supported by the principal officials in every district, and is to receive besides the direct encouragement of the State by the opening of Government appointments to those who have received a good education, irrespective of the place or manner in which it may have been acquired; and in the lower situations, by preferring a man who can read and write, and is equally eligible in other respects, to one who cannot.”*

There are three characteristic features of this despatch of 1854, which was ratified after the mutiny by the despatch of Lord Derby of 1859. FIRST, *The education of the poor*; SECOND, *The system of grants-in-aid*, as being suited to India in its present social and religious aspect; and THIRD, *The encouragement of self-help and local self-government*, in this department of education, which is seen to be no new notion of Lord Ripon's, as is supposed. To his lordship is due the merit of setting himself with characteristic earnestness to carry out a policy as begun under Lord Mayo, the principles of which were laid down in the despatch of 1854.

III.—*Progress made in Education under the Operation of the Despatch of 1854.*

The following table gives for each province of India THE NUMBER OF COLLEGES AND SCHOOLS, AND THE NUMBER OF SCHOLARS

* “Return—East India Education,” ordered by the House of Commons to be printed, 29th July, 1870, p. 7.

ON THE ROLLS, THE AVERAGE AREA, AND PROPORTION OF PUPILS TO THE POPULATIONS:—

TABLE I.

Name of Province.	Colleges, including Medical and Engineering Colleges and Mahomedan Madrissas.		Normal Schools and Technical Schools.		Schools for Boys.		Schools for European and other Foreign Races.	
	Institutions.	Students.	Institutions.	Students.	Institutions.	Students.	Institutions.	Students.
Bengal.....	35	3,848	50	1,934	25,565	619,074	49	4,580
Assam.....	—	—	13	345	1,172	33,092	—	—
N. W. Pro- vinces }	7	887	6	361	8,743	229,218	5	359
Oudh.....	3	196	23	828	1,308	60,976	2	122
Punjab.....	4	270	10	491	7,037	165,900	8	536
Central pro- vinces }	—	—	4	218	1,312	70,652	3	292
British Burma	—	—	1	26	3,117	55,082	—	—
Ajmere.....	1	190	2	26	137	2,496	—	—
Berar.....	—	—	1	44	678	26,700	—	—
Mysore.....	4	1,094	11	1,071	1,511	37,818	4	543
Coorg.....	—	—	1	2	78	2,655	—	—
Madras.....	21	1,448	20	676	6,175	157,220	21	1,617
Bombay.....	7	961	13	842	4,141	23,244	12	1,072
Total.....	83	8,894	155	6,864	60,974	1,695,531	104	9,121

Name of Province.	Mixed Schools for Boys and Girls.		Schools for Native Girls.		Total.		Average Number of Square Miles to each Institution.	Number of Pupils to each 1,000 of the Population.
	Institutions.	Students.	Institutions.	Students.	Institutions.	Students.		
Bengal.....	—	—	519	11,964	26,218	641,400	6	10
Assam.....	—	—	60	939	1,175	34,376	38	8
N. W. Pro- vinces }	—	—	245	6,550	9,006	237,375	9	8
Oudh.....	—	—	87	2,449	1,423	64,571	17	6
Punjab.....	—	—	352	10,184	7,411	177,381	14	10
Central pro- vinces }	1	51	87	3,053	1,407	74,266	60	9
British Burma	344	9,864	12	923	3,474	65,895	26	24
Ajmere.....	—	—	14	304	154	5,221	17	13
Berar.....	1	18	14	415	694	27,177	25	12
Mysore.....	8	287	42	2,799	1,580	43,612	19	8
Coorg.....	1	38	1	24	81	2,719	24	16
Madras.....	2,587	79,854	338	14,994	9,162	255,809	17	8
Bombay.....	13	803	231	12,019	4,417	248,140	28	15
Total.....	2,955	90,915	2,002	66,615	66,202	1,877,942	14	9

The above, from a Government "statistical abstract" of 1878, gives the present number and proportion within a very small frac-

tion in the two last columns; the increase in education being more than counterbalanced by the increase of population. It is a sad and significant fact, that it is necessary to take the number of pupils in the 1,000 of the population to avoid giving only a fraction of a child to each 100.

In the following table WE GIVE THE NUMBERS ON THE ROLL IN THE DIFFERENT CLASSES OF INSTITUTIONS—GOVERNMENT AIDED AND UNAIDED, IN EACH PROVINCE, up to the latest return:—

TABLE II.—*Number of Government, Aided, and Unaided Institutions, and the Scholars attending them, for each Presidency or Province of British India, Year ending March, 1881.*

Provinces.	Official Years ended 31st March.	Government Institutions.			Aided Institutions.		
		Number of Institutions.	Number of Students.	Average Daily Attendance.	Number of Institutions.	Number of Students.	Average Daily Attendance.
Bengal	1881	303	29,775	21,820	40,490	777,173	575,047
Assam	'81	34	3,203	2,294	1,148	34,172	22,809
N.W. provinces } and Oudh }	'81	6,200	205,065	156,391	347	18,856	14,727
Punjab	'81	1,752	88,616	69,351	336	16,307	12,525
Central provinces	'81	955	56,443	38,957	387	19,768	12,616
British Burmah ..	'81	47	2,778	2,136	838	34,247	33,464
Ajmere	'81	76	2,858	2,090	3	417	305
Berar	'81	475	26,327	17,965	134	2,856	2,322
Mysore	'81	899	33,287	25,425	188	9,370	7,293
Coorg	'81	56	2,703	1,282	3	89	67
Madras	'81	1,428	51,221	41,527	6,078	178,609	142,919
Bombay	'81	4,424	266,798	185,962	255	19,979	15,395
Total	'81	16,649	769,074	565,800	50,207	1,111,843	839,489

Provinces.	Official Years ended 31st March.	Unaided Institutions.		Grand Total of Institutions.	Grand Total of Students.
		Number of Institutions.	Number of Students.		
Bengal	1881	6,714	121,541	47,507	928,489
Assam	'81	105	3,296	1,287	40,671
N.W. provinces } and Oudh }	'81	48	1,482	6,595	225,403
Punjab	'81	—	—	2,088	104,923
Central provinces	'81	95	3,340	1,437	79,551
British Burmah ..	'81	2,381	51,683	3,266	88,708
Ajmere	'81	60	2,142	139	5,417
Berar	'81	266	3,038	875	32,221
Mysore	'81	—	—	1,087	42,657
Coorg	'81	—	—	59	2,792
Madras	'81	5,372	97,978	12,878	327,808
Bombay	'81	664	30,197	5,343	316,974
Total	'81	15,705	314,697	82,563	2,195,614

Our next table, taken from the statistical abstracts of 1881, gives the NUMBER OF INSTITUTIONS AND PUPILS, CLASSIFIED UNDER THEIR DIFFERENT HEADS OF UNIVERSITY, SECONDARY, PRIMARY, AND SPECIAL OR TECHNICAL EDUCATION, as given in the last official reports. We give only the GRAND TOTAL for the whole of India, leaving out the details from the different provinces.

TABLE III.—*Number of Colleges and Schools, and of Scholars attending them, during the Official Year ending 31st March, 1881.*

2	3	4			5	6	7
Institutions and Scholars.	University Education.	Secondary Institutions.				Primary Education.	
	Colleges.	High Schools.	Middle Schools.	Lower Schools.	Primary Schools.		
Insti- { tutions {	Males.... Females	87 1	463 22	3,323 148	1,701 318	72,824 2,082	
Total		88	485	3,471	2,019	74,906	
Scholars {	Males.... Females	7,436 5	57,103 798	143,925 7,130	58,001 8,383	1,790,113 103,415	
	Total	7,441	57,901	151,055	66,384	1,893,528	

2	8	9	10	11	12	13	14	15
Institutions and Scholars.	Special or Technical Education.							Grand Total.
	Schools of Art.	Medical Schools.	Engi- neering and Surveying Schools.	Normal Schools.	Indus- trial Schools.	Mad- rassas.	Other Schools.	
Insti- { tutions {	Males.... Females	5 —	12 —	16 —	95 15	30 3	458 —	938 —
Total		5	12	16	110	33	458	938
Scholars {	Males.... Females	407 11	836 —	751 —	3,278 499	1,563 111	4,392 1	7,424 9
	Total	418	836	751	3,777	1,674	4,393	7,433

These tables enable us to judge of what has been accomplished for education in India during the last twenty-eight years, and what remains to be done.

I shall first call attention to what has been done for the education of the great body of the people, as the primary instruction of the masses must ever be the first duty of the State; although in a country like India the State cannot, in the first instance, escape from the necessary duty of originating, and to a large extent conducting the higher as well as the lower forms of education. The

impulse must in the first instance come from without, although, as we shall afterwards see, there was a large and valuable amount of education and educational appliances previously existing in India.

By the last table, Col. 7, it appears that there are in all 1,893,528 scholars on the roll, giving, so far as we can make out from the average attendance of all institutions, given in Table II, not more than about a million and a half *in average attendance* in primary schools.

These schools are placed in three categories—Government, aided, and unaided schools, and we get the numbers in each approximately from Table II, which gives 302,063 in attendance on middle and higher schools and colleges of all kinds. See all columns of Table III, except Col. 7, and deduct the aggregate from Col. 15.

TABLE IV.

	Number of Institutions.	Number on the Roll.	Average Attendance.
In Government institutions.....	16,649	769,074	565,800
„ aided institutions	50,207	1,111,853	839,489
„ unaided „	15,705	314,697	—

Of the 1,893,528 on the roll in the department of primary instruction, it appears that the larger number are in *aided* schools. These are under the direction of missionaries, local bodies of natives, and private adventure, all receiving Government assistance on the grants-in-aid system: these grants being regulated by different rules in the different provinces, and often altered in a very arbitrary and fitful way, according to the ideas which predominate in the council of the local government, or the fancy of the director of public instruction for the province.

I do not think it worth while to occupy time in describing the many rules laid down for the distribution of grants, as they are sure to undergo revision at an early date. But I may say, that with many defects in the mode of administration, the system has been found admirably fitted for the present state of the country, and if it had been carried out in the spirit in which it was the intention of Government it should be applied, the results would have been much more beneficial than they have been. With all its faults, it has greatly extended education at a very small cost to the Government. In the provinces of Bengal and Madras a pupil in an aided school does not cost the Government more than ONE-TWELTH part of that of a pupil in a Government school. It has encouraged

both native and foreign enterprise, and called forth a large amount of liberality and of the spirit of self-help.

The character of these primary schools varies greatly. Those of Government may be allowed in the majority of cases to be highest of the three classes in the mere teaching department, though even in this, their strongest point, they are often surpassed by both aided and a few unaided schools. The aided are more brought into sympathy with their teachers, especially when these are under the management of missionaries, and the moral culture, and in a great many instances the general intelligence of the children, more highly developed. The unaided are of every possible gradation from the highest to the lowest: the larger proportion being of little value as educational institutions.

IV.—*Indigenous Schools.*

In speaking of these 1,893,528 pupils attending primary schools (Table III, Col. 7), which are either directly or indirectly connected with Government, we must not allow it to be supposed that these are the only schools in India. India was not an uneducated country when it came into our hands. It had from a very early period an elaborate system of education. There is reason to believe that with the exception of those districts inhabited by the aboriginal tribes scattered throughout the country, chiefly occupying mountain fastnesses from which they could not be expelled, or unwholesome jungles, from which it was not worth while to drive them, the whole of India was under some kind of education, and much of it of a high order.

It is no part of my plan to describe minutely the character of this education. I merely refer to the fact, that there was in the country a singularly perfect language, with a large body of learned men, and an extensive and varied literature of which any country might be proud. In arithmetic, which lies at the base of all progress in the exact sciences, especially of mathematics, mechanics, and astronomy, the Hindoos were early proficient, and the inheritors at a later period of the more perfect systems of the Arabians. They had their schools of law and medicine. Natural philosophy, chemistry, mineralogy, botany, and geology, were taught in their schools and colleges. I need scarcely add, that their systems of philosophy were ingenious and acute, and their theology elaborate and subtle. Even their history and chronology, with all their errors, had a certain value in their educational systems.

There is much sound common sense in the following minute by the East India Company, written when they were compelled by parliament in 1813 to devote 10,000*l.* a-year to education in India. "We are informed," they say, "that there are in the Sanskrit

“ language many excellent systems of ethics, with codes of laws
“ and compendiums of the duties relating to every class of the
“ people, the study of which might be useful to those natives who
“ may be destined for the judicial department of Government.
“ There are also many tracts of merit, we are told, on the virtues
“ of plants and drugs, and on the application of them in medicine,
“ the knowledge of which might prove desirable to the European
“ practitioner; and there are treatises on astronomy and mathe-
“ matics, including geometry and algebra, which, although they
“ may not add new light to European science, might be made to
“ form links of communication between the natives and the gentle-
“ men in our service who are attached to the observatory and to the
“ department of engineers; and by such intercourse the natives
“ might gradually be led to adopt the modern improvements in
“ those and other sciences.”

I rather think that since we began to introduce our English language and literature, great and important as that step was, we have neglected to make a bridge by which the natives of India might pass easily and naturally from the old world system of their ancestors, into the more perfect culture of modern times, and by which the precious discoveries of modern science might be carried over into the languages and intelligence of an ancient people.

I believe that these higher schools of early times are now to a large extent extinct, or when they exist, they are mere fossils of a better period, utterly unsuited to the wants of the present day, and are becoming every year, with the increase of the light and literature of the west, more worthless for any practical purposes, and unless they can be transformed by new methods, and breathed into with a new life, they must disappear or, like bats, retire into their caverns, before the advancing light which, contrary to natural and historic laws, now rises in the west.

The elementary indigenous schools are still deserving of a careful examination, and are to a large extent capable of being made the starting point of a new departure in the education of the people. They have to a large extent declined of late years, both in numbers and efficiency, partly owing to the poverty of the inhabitants, and partly from their lack of adaptation to the new wants of the people. The higher character of the government and aided schools has helped to degrade them in the eyes of the people, who find that their children trained in the old style are not capable of competing with those brought up in the schools formed on the western model, especially when they, by the addition of English, prepare their pupils for Government employment, or the service of Europeans. Still they are a power in the country, and cannot be overlooked in any estimate of educational appliances. It has been one of the

vices in the carrying out of our northern system, that these old schools have been ignored or frowned upon by our Inspectors and Directors of public instruction.

All have not been thus hampered by their early preconceptions, and some of the most successful educators have been men who availed themselves of what was good, or capable of being made good, in Indian schools, and have lifted the "hedge school" by degrees into the well-ordered village school. First and foremost among those benefactors of India was Mr. Thomason in the north-west, from whose noble efforts the framers of the educational despatch got some of their best suggestions; and we are glad to say several have of late been following in his footsteps, more especially the Directors of Public Instruction in Bengal, the Central Provinces, and Oudh.

The number of these indigenous schools is still very large, though not so numerous as they were half a century ago.

Mr. Adam, who spent three years in preparing his valuable report on the state of education in Bengal, for the Government, in 1835, p. 18, says:—

"The number of such schools in Bengal is supposed to be very great. A distinguished member of the General Committee of Public Instruction, in a minute on the subject, expressed the opinion that if one rupee per mensem were expended on each existing village school in the Lower Provinces, the amount would probably fall little short of 12 lakhs of rupees per annum. This supposes that there are 100,000 such schools in Bengal and Behar, and assuming that the population of those two provinces to be 40 millions, there would be a village school for every 400 persons."

And again, on p. 19:—

"Let it be admitted that these calculations from uncertain premises are only distant approximations to the truth, and it will appear that the system of village schools is extensively prevalent; that the desire to give education to their male children must be deeply seated in the minds of parents, even of the humblest classes; and that these are the institutions, closely interwoven as they are with the habits of the people and the customs of the country, through which primarily, although not exclusively, we may hope to improve the morals and intellect of the native population."

The number attending each school is small, and an average of 10 or 12 pupils would probably be large enough. This would only give say 1,200,000 pupils for a population then estimated at 40 millions; and there is reason to believe that now, with a population of 69 millions, the number is not so large as it was in 1835.

From "A History of Indigenous Schools in the Punjab," prepared by Dr. Leitner for the Education Commission, with a proof copy of which I have just been favoured, we have the means of judging with tolerable certainty of the state of these schools in that province, far more full and reliable than anything we have for any other province in India.

Dr. Leitner gives reasons for believing that there has been a great falling off in these schools for some time back. There is good ground for the belief that at one time there was a school in each of the 28,879 villages of the Punjab, which, with an average of little over 10 to each, would give about 300,000 pupils; as many of the villages had more than one school, this number was probably much higher. Now we cannot reckon more than 95,000 pupils in schools of this class, or at the most 120,000, in about 12,000 schools in the 29,000 villages of the province.

Dr. Leitner sums up his remarks on this part of his inquiry in these words, p. 16:—

"To sum up. Although 60,168 pupils, the lowest number according to the census, probably attending indigenous schools in the province, or even 96,585 under instruction not given by Government or aided schools (not to speak of my conjecture that presumably 120,000 persons receive indigenous instruction in the Punjab), may be considered to be a great falling off from the 300,000 pupils who, according to my lowest estimate, attended school before the annexation of the Punjab, it is obvious that there still exists a considerable educational material that may yet be saved from destruction, and that may even be largely increased and improved, provided the steps are taken that I will venture to indicate hereafter."*

In the Madras presidency Sir Thomas Munro, after careful inquiry, comes to the conclusion, "*that there were in that province, in the year 1822 not fewer than 12,498 schools, containing 188,650 scholars in indigenous schools,*" and in Bombay at the same period, "*schools were found to be scattered all over the province,*" as was reported in answer to Mount-Stuart Elphinstone's inquiries on the subject.

Dr. Leitner well observes, after quoting these facts, also referred to in Mr. Adam's report, p. 21: "It is much to be regretted that, as each province fell under our rule, the Government did not take advantage of the time when the prestige of conquest, or gratitude

* Since the above was in type, I am favoured with a copy of an able paper prepared by Mr. Holroyd, Director of Public Instruction for the Punjab, for the "Commission," contesting some of Dr. Leitner's statements; amongst others, the diminution of indigenous schools, and showing that certain classes of them had been turned into Government or grant-in-aid schools.

“ for delivery from war or oppression, were strong in the popular mind, to make the village school an important feature in the village system that was almost everywhere transmitted to us. Had this been done, and had the numerous village allowances been directed to this object, and had the Government devoted itself to the improvement of school books and schoolmasters, instead of establishing a few new schools of its own, and thereby encouraging the belief that it was for the State, and not for the community to look after education, the work of general improvement would have been substituted for the work of partial construction, and we should now have had in every province a really adequate system of national primary education. Sir Thomas Munro aimed at this in Madras, as did Mount-Stuart Elphinstone in Bombay, and Lord William Bentinck in Bengal, but their views were overridden by men who, if less far seeing, were more persistent.”

It is a subject of much regret to the friends of education in India that no systematic effort was made at an early period to get at careful and reliable returns of the number and character of those indigenous schools in all parts of the country. The efforts made by Mr. Adam in 1835, under the patronage of Lord William Bentinck, led to no practical results in his time, and the good man threw up a lucrative appointment rather than be a party to unsatisfactory decisions come to on the presentation of his report. But there is little doubt that at a later date the facts he had brought to light stimulated and helped men like Sir George Campbell and Sir Ashley Eden, when lieutenant-governors of Bengal, to carry out their noble aims for the education of the masses; and one of the grandest efforts for primary education carried out by Mr. Croft, the present director of public instruction for the province, is based on the policy of *improving* instead of *superseding* these indigenous schools which Mr. Adam had brought under public notice.

It is satisfactory to find that the present Viceroy's Education Commission takes this view, and the fourth question put to each witness brought before it is as follows:—

“ Q. 4. To what extent do indigenous schools exist in your province? How far are they a relic of an ancient village system? Can you describe the subjects and character of the instruction given in them, and the system of discipline in vogue? What fees are taken from the scholars? From what classes are the masters of such schools generally selected, and what are their qualifications? Have any arrangements been made for training or providing masters in such schools? Under what circumstances do you consider that indigenous schools can be turned to good account as part of a system of national education, and what is the best method to adopt for this purpose? Are the masters willing to

“accept State aid, and to conform to the rules under which such aid is given? How far has the grant-in-aid system been extended to indigenous schools, and can it be further extended?”

As a good many of the official records of the examination of witnesses have been kindly sent to me by friends, I cannot do better than give a few of the answers. They are necessarily partial and imperfect, as none of the parties had the means or opportunity of making any systematic or extensive investigation, but those which I shall give are from men who had the best opportunities of knowing the facts.

Evidence of P. VEJIARANGA MUDALUVAR, Esq., first deputy-inspector of schools, Madras :—

“A. 4. In the town of Madras indigenous schools are fast disappearing. They are giving way to Anglo-vernacular schools. The few indigenous schools that do still exist are resorted to by very poor people, generally the children of artisans and coolies. In these schools, cadjan books and wooden planks (for slates) are still used. The most important and useful subject taught in these schools is the multiplication table of integers and fractions. There is scarcely any prose read. Poetry, which generally consists of hymns and moral aphorisms, is learnt by heart, but not understood. The discipline in these schools is generally loose, except that the children are kept in constant dread of the teacher's cane. The school fee varies with the capacity of the parents, between two and eight annas per mensem. This is not regularly paid. Besides the monthly school fee, each pupil pays the teacher a pie or two and some rice on feast days, and also a present whenever a book is begun. The generality of the teachers of these indigenous schools are old and crippled men and those who cannot earn their livelihood by any other means. Their only qualification is that they can read and write and cast accounts in the old, but not bad, native method. The number of such indigenous schools is larger in the Mofussil, but even there they are gradually giving way to improved schools. Several normal schools exist in the Madras Presidency for training and improving these indigenous schoolmasters, but very few of them can be induced to leave their villages and attend these schools.”

Evidence of J. STURROCK, Esq., C.B., collector and magistrate, South Canara :—

“A. 4. There is not, and as far as I know never was, an extensive and well organised system of indigenous schools in South Canara. Indigenous village schools there are of course here and there, but they are seldom of a permanent nature, and are usually kept by the ‘shanbogue’ or clerk of some landholder, either in connection with the education of his master's children or as a

“ private speculation of his own. There is little of a distinctive character about the education imparted by them now, as they are usually ready to adopt modern methods of instruction, and apply for result grants if they think they are likely to get them. Specially careful instruction in reading ‘cadjan’ documents, a larger multiplication table, and greater attention paid to teaching songs and poems, are the points in which it is sometimes alleged that the old schools were superior to the new.

“ When making inquiries in 1871, when the Local Fund Board was started, I could hear of only ninety-two indigenous schools, of which twenty-eight were then under Government inspection. Amongst these I do not include purely sectarian Mohammadan schools imparting instruction solely in the Koran.”

Evidence of P. CHENTSAL ROW, Esq., Superintendent of stamps and stationery, Madras :—

“ A. 4.—I have no statistics to show the number of indigenous schools other than those under Government inspection, but there is no doubt that some exist. In 1820, the number of indigenous schools was ascertained to be 12,000, and probably about two-thirds of them have now come under Government inspection. In these schools the boys are taught to read and write, and are also made to learn the names of years, months, and days, and they are taught a little of arithmetic and a few rules of mensuration, and much pains are taken to cultivate the memory of boys. Fees are taken either in the shape of money or grain. The teachers are generally selected from among the class of Brahmins, and as a rule the office passes from father to son.”

Under another question he says :—

“ Formerly there was a Brahmin more or less in each village, known as Vadyar, Panchangi, or Purohit, whose duty it was to supply the intellectual wants of the village by way of teaching the Vedas, reading the calendar, and officiating at ceremonies. These men used to be remunerated by rent-free land, or grain fees, or both; and it is a great pity that their office was abolished, and their Inam lands enfranchised, instead of being utilised for maintenance of a schoolmaster.”

Evidence of V. KRISHNAMA CHARIAR, Esq., Curator and Registrar of Books, formerly an inspector of schools in the Madras presidency :—

“ 4. (a.) So far as I am present able to say, nearly one-half of the primary schools in the country are indigenous schools.

“ (b.) They are a relic of the ancient village system, as the following facts prove :—(1.) They retain the old hours of attendance, which are from day-break to sunset, and even later, with intervals for meals. (2.) The schoolmasters continue to receive

“ payments in kind, such as a certain quantity of fuel, the dole of oil on Saturdays, the measure of rice, &c., on certain feasts, and the Desara feast presents, and other perquisites. (3.) They still hold their schools on pyals, by the side of houses, or under trees or other places exposed to the public view, instead of having some other suitable premises.

“(c.) The subjects taught are mostly poetry and village accounts. The teaching is unsystematic and unintelligent, and there is more individual than class teaching. A boy is often said to have mastered a book if he is simply able to read it over or recite it *verbatim*, without understanding the sense, no attempt being made to explain the meaning and matter of what is read, or to point out any peculiarities of idiom and grammar. Too often the teacher himself of the old indigenous type is not able to read the passage with due regard to sense, emphasis, &c.

“(d.) The discipline is rather unsatisfactory, there being hardly any classification of pupils, or teaching them in class by questions and answers, nor any order either in giving lessons or receiving them. The boys read or bawl out indiscriminately at the top of their voices; and this is enough to satisfy their parents, who think that the understanding of what is read will come in time. Similarly punishments, in some cases barbarous, are inflicted upon boys less with reference to the nature of the offence than to the wealth or poverty of their parents, or according to the temper of the teacher.

“(e.) The fees are paid both in money and in kind, but not regularly. Sometimes the teacher has to wait for the harvest season, and in some cases the payment is made annually.”

The following is important as the testimony of a man of much experience and good opportunities of knowing the language and the feeling of the people, as to the question of using the indigenous schools as a basis for a better system.

Evidence of the Rev. J. Cooling, B.A., Wesleyan Missionary, Madras:—

“ The objection generally urged against such a course (the utilising of native schools) is that the condition of these schools is so bad, and the prejudices of the teachers so strong, that improvement is hopeless. No doubt the subjects taught in them are generally of no practical value, and the methods of instruction of the most barbarous kind, so that the description given in 1823 by the collector of Bellary in his report to Sir Thomas Munro (*vide* Appendix D of papers relating to public instruction, compiled by A. J. Arbuthnot, 1855) is substantially correct to-day, yet there is this very important difference: then the parents and teachers were satisfied with the state of things, now there is a growing

“feeling of dissatisfaction among both, and a willingness on the part of teachers to submit to the conditions upon which they can obtain Government aid. Such is the state of feeling in the majority of districts, that without any very extravagant outlay of money, most of the indigenous schools could readily be brought under inspection and improvement. In some districts many such schools have thus been improved, and there seems no reason why means that have been successful in one district should not under similar conditions be equally successful in another.”

In answer to a set of questions which I sent to a number of missionaries and others in different parts of India, one of which was :—

“Are there any unaided indigenous schools in your district of such a character as to benefit the people?” we received a few returns, but the answers, though pretty numerous, were not satisfactory as to the number of such schools, as the qualification of *usefulness* restricted the answer. A few from different parts of the country from the preceding are of value.

The Rev. George Shirt writes from Hyderabad Sindh, “There are a few such, not many.”

From the Deccan, the Rev. J. G. Hawkes Belgaum writes, “Our unaided indigenous schools are few, small, and of little value.”

From Bombay, Mr. W. F. Melvin writes, “There are many private unaided schools here.”

The Rev. J. H. Walters writes from Bangalore, “There are a few unaided indigenous schools in the Mysore, but they are of very little value.”

The following is of much value as being the joint testimony of six distinguished educationists chosen as a committee to represent the great body of missionaries in southern India :—

“5. There are numerous indigenous schools throughout the presidency, known as pial schools. Many of these are now being improved and developed by local fund boards and municipalities. This mode of action can be carried on indefinitely, if only there are sufficient local resources. The taxes for this object cannot be indefinitely increased, but aid could be afforded out of the present allotment to education from provincial revenues, if the policy laid down in the despatch were carried out.”

The following samples of the multiplication tables taught in India, give an idea of the way in which memory is cultivated in these indigenous schools.

In Bengal one of the first tables is to multiply up to 16×16 , and then to multiply by fractions from $1 \times \frac{1}{4}$ up to $6\frac{1}{2} \times 25$.

Dr. Leitner gives the following as being in common use in the

Punjab. The simple multiplication 1 to 10—for they all reckon by decimals—is not thought worth mentioning.

TABLE V.—*Multiplication Table as taught in a Hindi School.*

[From Dr. Leitner's "History of Indigenous Education in the Punjab," part iv, p. 5.]

1. Multi- plication by $\frac{3}{4}$.	2. Multi- plication by $1\frac{1}{4}$.	3. Multi- plication by $1\frac{1}{2}$.	4. Multi- plication by $2\frac{1}{2}$.	5. Multi- plication by $3\frac{1}{2}$.	6. Multi- plication by $4\frac{1}{2}$.	7. Multi- plication by $5\frac{1}{2}$.
1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $1\frac{1}{4}$	1 $2\frac{1}{2}$	1 $3\frac{1}{2}$	1 $4\frac{1}{2}$	1 $5\frac{1}{2}$
2 $\frac{3}{4}$	2 $\frac{3}{4}$	2 $1\frac{1}{4}$	2 $2\frac{1}{2}$	2 $3\frac{1}{2}$	2 $4\frac{1}{2}$	2 $5\frac{1}{2}$
3 $\frac{3}{4}$	3 $\frac{3}{4}$	3 $1\frac{1}{4}$	3 $2\frac{1}{2}$	3 $3\frac{1}{2}$	3 $4\frac{1}{2}$	3 $5\frac{1}{2}$
4 $\frac{3}{4}$	4 $\frac{3}{4}$	4 $1\frac{1}{4}$	4 $2\frac{1}{2}$	4 $3\frac{1}{2}$	4 $4\frac{1}{2}$	4 $5\frac{1}{2}$
5 $\frac{3}{4}$	5 $\frac{3}{4}$	5 $1\frac{1}{4}$	5 $2\frac{1}{2}$	5 $3\frac{1}{2}$	5 $4\frac{1}{2}$	5 $5\frac{1}{2}$
6 $\frac{3}{4}$	6 $\frac{3}{4}$	6 $1\frac{1}{4}$	6 $2\frac{1}{2}$	6 $3\frac{1}{2}$	6 $4\frac{1}{2}$	6 $5\frac{1}{2}$
7 $\frac{3}{4}$	7 $\frac{3}{4}$	7 $1\frac{1}{4}$	7 $2\frac{1}{2}$	7 $3\frac{1}{2}$	7 $4\frac{1}{2}$	7 $5\frac{1}{2}$
8 $\frac{3}{4}$	8 $\frac{3}{4}$	8 $1\frac{1}{4}$	8 $2\frac{1}{2}$	8 $3\frac{1}{2}$	8 $4\frac{1}{2}$	8 $5\frac{1}{2}$
9 $\frac{3}{4}$	9 $\frac{3}{4}$	9 $1\frac{1}{4}$	9 $2\frac{1}{2}$	9 $3\frac{1}{2}$	9 $4\frac{1}{2}$	9 $5\frac{1}{2}$
10 $\frac{3}{4}$	10 $\frac{3}{4}$	10 $1\frac{1}{4}$	10 $2\frac{1}{2}$	10 $3\frac{1}{2}$	10 $4\frac{1}{2}$	10 $5\frac{1}{2}$

He also gives the following as taught in the Punjab. I do not give the number of each table, as it would not add to our knowledge, p. 181, part ii:—

1. 1×10 to 5×10 .
2. 6×10 „ 10×10 .
3. 11×10 „ 15×10 .
4. 16×10 „ 20×10 .
5. 21×10 „ 25×10 .
6. 26×10 „ 30×10 .
7. 31×10 „ 35×10 .
8. 36×10 to 40×10 .
9. $1 \times 1\frac{1}{4}$ „ $50 \times 1\frac{1}{4}$.
10. $1 \times 1\frac{1}{2}$ „ $50 \times 1\frac{1}{2}$.
11. $1 \times 2\frac{1}{2}$ „ $50 \times 2\frac{1}{2}$.
12. A table of money.
13. „ measurements.

While such exercises may improve the memory, there is a deplorable want of any proper exercise for the understanding, and it is found that after learning by rote a large number of tables and examples, the youths are found incapable, on leaving school, of applying these rules to new cases. There are however examples of good and efficient schools in almost all parts of India, in which the children are taught to keep account books, and even a little mensuration. The trading class get either at home or in school enough to enable them to follow the future occupation or profession of their fathers, which is always hereditary, and may become a hereditary instinct, like that developed in animals, and sufficient for the vegetating existence of an unprogressive race: it is not education suited to the wants and aspirations of the human mind.

From these figures and facts, and others which might have been brought forward, we learn:—

1st. That from a very early period there has existed a system of

education at one time suited in a measure to the limited wants of the people, though now greatly reduced in extent and efficiency, and altogether inadequate to the necessities of a growing population and progressive civilisation.

2nd. That in many cases there were endowments in land for the support of a teacher in the villages, and that these have been to a very large extent lost or diverted from the objects for which they were destined. The extent to which this has been done is not known, but is worthy of inquiry. Dr. Leitner, in his "History of "Indigenous Education in the Punjab," laid by request before the Commission, gives long lists of grants for education which have been allowed to lapse or have been resumed, with the names of places and parties. Similar though less definite statements have been made in different parts of India.

3rd. That the people of India have been accustomed to self-imposed taxation for educational purposes, and a large number of the richer classes have liberally contributed for its support, while many of the priestly classes, both Hindu and Mohammadan, have given instruction gratuitously as a religious duty.

4th. That fees have been paid in a great variety of ways, suited to the circumstances of the people—some in money, others in kind, or by feeding the teachers in turn, or irregular gifts at certain times or on festival occasions.

I call attention to these peculiarities, not as examples which can be followed or which it would be desirable to follow, but they suggest that in any future legislation it would be well not to lay down rules to be rigidly applied alike to all places and classes of the people, whose old habits ought not to be disregarded by Government.

While these indigenous schools are capable of being used as a basis to start from in a better system of instruction, I must at the same time give expression to the general conviction, that in their present form they are of little or no practical value for the real education of the people: their methods are bad; their materials for instruction are wretched; their training is not fitted to develop the mind. The *morale* is very low; in many it is positively vicious. Many of the lessons taught are absolutely immoral, and inculcate vices, even of an unnatural kind. Even the passages taken from their religious books are full of vile stories of their gods, which by the higher class of their priests or teachers may be allegorised or explained away, but by very many of the teachers of a lower type the worst stories are enlarged on and gloated over with a fleshly realism which is most pernicious to the youthful imagination and morals.

Many of those of a better class morally, are intellectually of

little value. Some are attached to Hindoo temples, where they are taught a theology which does not elevate them, or are only taught to repeat by rote a liturgy of which they never learn the meaning. Many are found in Mohammadan mosques. Haroun-Al-Rachid anticipated the enlightened policy of John Knox, the reformer of the sixteenth century, who insisted on a school being built by the side of each church in Scotland. Haroun in the eighth century gave orders that every mosque throughout his vast empire should support a school or college. The great misfortune was that while he made provision for boys, he, and still more his successors, in their jealous seclusion of women, not only shut out one-half his subjects from the blessings of education, but confirmed and extended the curse of ignorance over the women of India when they became subject to the Moslem rule. There is reason to believe that the native females were not at the early and better periods of Indian history, either secluded or kept in ignorance as they have been in later times. Much of the teaching in these schools is now only a fossil of the famous schools of Bokhara, Fez, and Cordova, and many of them only a learning by rote of portions of the Koran.

The most painful feature of popular education in India is this state of abject ignorance of the women. From the first table it will be seen that in all India there are not more than 2,002 female schools, attended by only 66,615, and 2,955 mixed schools, with 90,915. If half the scholars in these were girls, this would only give 112,000 girls under instruction. But as we must allow for some girls being taught privately, and some women in the Zenanas, we may credit the higher estimate now given, as what seems good authority, *that there are 133,000 females under some kind of instruction in India*. The small number seems only a mockery, and many of these schools are of little value. But for the efforts of missionary societies the education of women would not even have made a beginning. In this department Government in direct teaching seems powerless; their best efforts are suspected, and their schools shunned.

V.—Numbers still Needing Instruction.

In estimating the number of the youth of India for whom provision must be made, if we are to aim at a national system of education for the people, we see *no reason for fixing on any lower average than 1 in 6 of the population*. I do not exclude the females. The prospect of overtaking the education of either the boys or girls is a gigantic enterprise, and its accomplishment remote, but we must not lower our ideal. It is true that the habits and needs of the inhabitants, and even the physical development of the people, are different from those of Europe; they require an

earlier period for commencing the work of education, and a still earlier period for its close. But these considerations are more than counterbalanced by a fact which must be kept in mind, *that the number of youths of school age is much greater in proportion to the population in India than it is in Europe.* If youth is more precocious, life is also shorter.

By the following comparison of the population of India and England at different ages, we find the striking fact brought out that *the proportion of the population under 12 years of age in India is almost quite as large as the portion under 15 is in England;* and were it not that the number of females of that early age in India is unnaturally low, the equality between the proportion of Indian girls under 12 and English girls under 15 would be equally striking. The following table gives the data of our comparison:—

TABLE VI.—*Population of British India under Twelve Years of Age, Classified according to Sex and Age.*

[Made from "Statistical Abstract," 1881.]

Males.			Females.		
Boys under 12.	Total Population.	Percentage under 12.	Girls under 12.	Total Population.	Percentage under 12.
35,788,154	98,067,555	36.49	31,182,746	92,582,657	33.67

Population of England and Wales under Fifteen Years of Age, Classified according to Sex and Age, Census of 1871.

Males.			Females.		
Boys under 15.	Total Population.	Percentage under 15.	Girls under 15.	Total Population.	Percentage under 15.
4,108,053	11,058,934	37.04	4,093,988	11,653,332	35.99

Assuming then that 1 in 6 of the population is a fair proportion* for attendance at school in India, this, according to the

* To show how low our estimate is, we annex in a note the following from the "Report of the Committee of Council on Education in England and Wales for 1882:"—

"In 1881, the estimated population (at the middle of the year) being 26,055,406, the children of school age will have risen to 6,146,104; and deducting from that number one-seventh, as being the children of a class above that commonly found in public elementary schools, the remainder, 5,268,089, is the number of children, from 3 to 13, for whom elementary education falls to be provided. If we assume that each child goes to school for only seven years out of the ten of its proper school life, there ought to be 3,687,662 children under daily instruction in our schools.

census of 1880, with its 198,508,793 people in British India, would give 33,084,764 to be provided with school appliances. We do not say *accommodation*, for we have seen that nature and art are provident in that land, where the shadow of a tree or the verandah of a house are sufficient for the commencement of our work of instruction. Deducting the numbers provided for, which according to the last reports are found to be only 2,195,614 in all kinds of schools of which Government takes cognizance, we have 30,889,090—in round numbers, *thirty millions of the youth of India unprovided for by Government with the proper means of elementary instruction*. In fact, only about *one child in ten of school age is as yet properly cared for*.

The most unsatisfactory circumstance is that the increase of scholars in the schools has not even kept pace with the *birth-rate* of the population; that while the increase of scholars was only on an average 60,000 over the whole period of the operation of the present education Act, the population was increasing during that time at a rate which added on an *average 250,000 children of school age to the population*. That in fact the *uneducated* were increasing at the rate of nearly 200,000 a year.

I cannot allow this reference to the increase of population in India to pass without a reference to its profound significance. It casts a dark shadow over the future of the country, and a deep gloom over the past.

There is no reason to question the accuracy of the estimate given by our President in his opening address, that the population of India under our rule doubles itself in a hundred years. It is the estimate which has been accepted at the India House by its most cautious and accurate financiers and statisticians. In presence of the fact that densely populated countries like Scotland and England, with a large emigration, double themselves, the former in seventy-four years and the latter in seventy-two years, while America doubles its population in twenty-five years, there is nothing incredible in it. It is true that the census for the last decade in India gives only half the rate of cent. per cent. in a hundred years: the adverse circumstances during this period have been exceptionally severe.

But taking the rate of increase to be one-half the above estimate, and only at the known rate during these ten years, which have

“It follows from these considerations that more than a million of names have still to be added to the number (4,045,362) already borne on the registers of inspected schools; and that a further increase of at least 800,000 may even now take place in the average attendance at the schools, which has risen from 1,152,389 in 1870 to 2,863,535 in 1881, *i.e.*, from 5.0 to 10.99 per cent. of the population.”

been exceptionally adverse to the increase of population, not only from the millions who have actually died, but from the great check given by famine to the national birth-rate, and what is the thought suggested as to the future not only in respect of the supply of education but of food.

The fact stares our Government and every philanthropist in the face, that without any further acquisition by conquest, of which I hope we have seen an end, there will be in another hundred years of our rule in India, 400 millions of people, without any corresponding increase of area for the growth of food, even if lands now uncultivated be brought under the plough.

But while this rapid increase of population bears witness most eloquently to the security of life, and the beneficence of our rule, it casts a lurid light on the past history of that country, and contrasts the conquests of modern civilisation with those of the past, even when by substantially the same Aryan race.

Take the rate at only cent. per cent. in *two* hundred years, and let us form an estimate of what the population of India would now be, if the results of the early Aryan conquest or rather *migration*, which should have tended to increase population in a thinly peopled country all the more rapidly, had in any way corresponded to that of our conquest, without emigration.

Supposing the early Aryan immigrations into India to have been well established even at a period as recent as four hundred years before the Christian era, and that the entire aggregate of the population of the country, including both conquered and conquerors, was only 5 millions, and we should have the following results: results which under such a Government as India now enjoys would have been realised far more easily than they are being realised now under British rule, but which not having been realised, suggest sad thoughts of the past history of that country, and ought to call forth gratitude in the heart of the natives of India towards our Government, whose firm and beneficent rule in preserving life forms its chief source of embarrassment in sustaining it.

Natural Increase of Population at the Rate of Cent. per Cent. in Two Hundred Years.

B.C.			
400 years,	Population of India, say, only	5,000,000	
200	„ should have been	10,000,000	
A.D.			
1	„ „	20,000,000	
200	„ „	40,000,000	
1800	„ „	10,240,000,000	

In other words the population of India would have been 10,000 millions more than it now is, that is to say, seven times the popu-

lation of the whole world, an unreal but yet no mere fancy picture. It tells of cruel conquerors sweeping over the land in successive waves of blood, of desolating internal wars, of oppressive governments crushing out the nation's life, of famines and pestilences, and those unnumbered and unutterable miseries which follow in their rear, making life wretched and increase of population impossible. I have put the population of all India at 5 millions at the close of the fifth century before Christ: there is great probability that it was as great as it was when we began our conquest of the country. If we are to attach any value to either its history or mythology, it must have been much greater.

But returning from this digression to the comparative school-rate and birth-rate of increase in India, it appears that the increase of scholars, instead of becoming every year more rapid in geometrical ratio, was in reality becoming comparatively slower and slower. From 1857 to 1866, allowing three years for organisation, they rose from 8,490 institutions with 190,856 pupils, to 18,563 institutions with 590,217 pupils in average attendance, *trebling the number of scholars in nine years.** And had this fervour of early zeal, under the able and disinterested management of members of the civil and military service of the Government been kept up, there would have been hope for the education of India. But the management has got into other hands. Education has become a bureaucracy, and, like other bureaus, it is steadily settling down into a self-contained, self-satisfied, if not self-aggrandising system. What is the rate of increase since? From 1866 the numbers only rose from 590,317 in average attendance to 1,153,217 in 1879.† *They barely doubled their number in thirteen years.* And on comparing the return of 1879 with that of 1878, we find that there is *an actual decrease of 25,862* in average attendance, and of not fewer than 65,000 of the pupils on the roll.

To show what can be done in the way of increasing the numbers of scholars in a country less favourably situated than India, I may point to Japan, which only began to introduce Western culture a few years ago, and already has outstripped India in the number of its primary schools and pupils.

Such was the state of matters in 1879, when the movement began which led to the appointment of the "Education Commission." We are happy to say that since that time a great change has taken place for the better, at once showing the need for a new stimulus, and what can be done by energy and good management.

* Statistical Abstract, British India, 1866, p. 45. Published in 1868.

† Statistical Abstract, British India, 1869-70, 1878-79. Published in 1880.

VI.—*Expenditure on Education in India.*

The following table, taken from a paper read before the Commission by Mr. Arthur Howell, one of its most useful members, shows the EXPENDITURE ON EDUCATION BY GOVERNMENT, AND FROM ALL SOURCES, WITH SPECIAL REFERENCE TO PRIMARY EDUCATION, WITH THE AREA AND POPULATION OF EACH PROVINCE.

TABLE VII.—1879-80.

[Extracted from the Educational Reports of each Government or Administration for the Year 1879-80.]

1	2	3	4	5	6	7
Provinces.	Area in Square Miles.	Population.	Government Expenditure on Education from Imperial Revenues in 1879-80 (exclusive of Local Cess).	Total Expenditure on Education.	Government Expenditure on Primary Education for Boys.	Total Expenditure on Primary Education for Boys.
			Rs.	Rs.	Rs.	Rs.
1. Bengal	156,286	60,738,217	21,96,791	25,68,547	2,95,519	11,72,906
2. Madras.....	138,856	31,385,820	10,37,209	28,23,473	1,19,751	10,23,189
3. Bombay	124,105	16,349,806	11,02,630	24,13,176	2,34,635	9,54,591
4. N. W. provinces } and Oudh }	105,991	42,005,299	9,58,651	20,10,378	1,75,072	8,34,982
5. Punjab.....	107,010	17,611,498	5,58,522	13,41,118	84,318	4,69,108
6. Central provinces	84,208	8,173,824	3,23,615	6,10,690	82,140	2,52,319
7. British Burmah	87,464	3,088,902	2,23,996	4,10,067	45,138	1,46,161
8. Assam	45,303	4,124,972	1,41,551	2,64,910	23,743	80,366
9. Berar	17,711	2,227,654	2,23,307	3,15,489	1,20,411	1,75,440
10. Coorg	1,572	168,312	17,981	22,967	2,423	7,188
Total	868,506	185,874,304	67,84,253	1,49,80,215	11,83,150	51,16,250

The table which follows is also from Mr. Howell's able paper, and shows the way in which the entire imperial grant for education is expended in each province, and the cost of each department of education. It is the more important to look well into the way in which the grant is expended, as the sum devoted by Government for this all-important object is so small, only about three-quarters of a million in the gross for the whole of India, and as part of this is paid back, the net sum is only about 678,000*l.* a year.

TABLE VIII.

1	2	3	4	5	6	7	8	9	10
Imperial Expenditure on Education, 1879-80 (Details of Col. 4, Table VII).									
Provinces.	Univer- sities.	Colleges or Depart- ments of Colleges.	Higher Schools, Secondary Education.	Primary Education.	Normal and Technical Education.	Female Educa- tion.	Direction and Inspection.	Miscel- laneous.	Total Expendi- ture from Provincial Revenues, Col. 4, Table I.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1. Bengal	*	5,09,010	6,00,719	2,95,519	2,01,999	80,336	4,15,953	93,255	21,96,791
2. Madras	*	1,45,981	2,25,562	1,19,751	1,34,260	83,142	2,24,605	1,03,908	10,37,209
3. Bombay	31,547	1,54,106	2,26,524	2,34,635	1,05,320	37,201	2,07,723	1,05,574	11,02,630
4. N.W. pro- vinces and Oudh }	—	1,31,528	2,92,212	1,75,072	49,999	53,062	2,44,110	12,668	9,58,651
5. Punjab	21,000	54,465	1,82,996	84,318	31,082	41,346	1,24,562	18,753	5,58,522
6. Central provinces {	—	15,002	74,174	82,140	28,735	5,025	1,01,391	17,148	3,23,615
7. British Burmah }	—	—	54,689	45,138	7,276	10,064	58,209	48,620	2,23,996
8. Assam	—	—	51,521	23,743	16,613	1,407	44,039	4,228	1,41,551
9. Berar	—	1,801	27,436	1,20,411	3,306	1,963	48,198	20,192	2,23,307
10. Coorg	—	—	5,064	2,432	2,422	120	7,065	887	17,981
Total	52,547	10,11,893	17,40,896	11,83,150	5,81,012	3,13,666	14,75,855	4,25,233	67,84,253

	Bengal. Rs.	Madras. Rs.
* For these Universities the Receipts were	93,950	54,311
and the Charges were	92,251	53,155
Leaving a balance in favour	1,699	1,156

It appears from the foregoing tables that the expenditure on primary education was quite inadequate to the wants of the country. From Mr. Howell's paper read before the Commission in March, it is seen, Table VII, Col. 6, that the entire sum spent on the primary education of the whole of India was only Rs. 11,83,150, or little more than 118,000*l.* a year, and about 30,000*l.* more on female education in all its branches, chiefly *primary*. At the same time they were spending, Col. 4, Table VIII, on higher and secondary education, Rs. 17,40,897, on arts colleges, Col. 3, Rs. 10,11,893, on universities, Col. 2, Rs. 58,547, and on technical and normal education, Col. 6, Rs. 5,81,012; that is to say, from direct imperial grants they spent fully 300,000*l.* on higher education for about 100,000*l.* on primary instruction. The few, and many of these the richer class, were receiving three times as much to educate them for lucrative appointments, as the masses of the poor were receiving to educate them for the necessary duties of everyday life.

A reference to Table VII, Col. 7, where it appears that the sum spent on the primary education of boys amounts in the aggregate to Rs. 51,16,250, or nearly five times as much as the imperial grant, seems to contradict our statement.

In reality this fact only brings out an aggravation of the evil—I may say the injustice of the present system. It is a notorious fact, that the larger part of the imperial revenue is derived from the land. That this revenue is more of the nature of a rent than a tax is nothing to our present purpose. We call attention to the fact that it is derived chiefly from the ryots, or agricultural classes; and yet we find, first, that by far the larger part of the grant from that imperial revenue so derived is devoted in the proportion of 3 to 1 to the higher education, chiefly in our large cities, and is spent on a class richer than the ryots; and secondly, that to promote the lower education a *fresh tax falling chiefly on the poor is imposed for their elementary instruction*. The following table, though not coinciding exactly with Mr. Howell's figures, will show with sufficient accuracy the sources of revenue for educational purposes. It is taken from the "Statistical Abstract for 1880."

TABLE IX.—*Receipts for Education in British India for 1880.*

Received from								
Grants from Provincial Revenues.	Local Rates or Cesses.	Endowments.	Subscriptions.	Municipal Grants.	Revenues of Native States.	Fees and Fines.	Funds other than foregoing.	Total.
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
70,24,461	23,92,254	4,40,747	6,00,755	3,60,726	1,94,250	31,78,172	20,15,773	1,52,07,138

1. What are called "grants from provincial revenues" are given from the *imperial* grant for education, which is handed over by Lord Mayo's localisation scheme, in a certain proportion to each province, and disposed of as "provincial revenue."

2. The local cess, and the grant from municipal bodies, are all devoted to primary education.

3. Fees are exacted in all schools supported or aided by Government.

The "local cess," "municipal grants," and a portion of the "fees," make up the difference in Cols. 6 and 7 of Table VII.

By way of contrast we give in Appendix A the revenue and expenditure on elementary schools in England for 1881.

VII.—*Fees in Schools and Colleges.*

It is impossible to give the fees in all the institutions of India, they vary so much in different parts of the country: no two pro-

vinces are alike; and even in different parts of the same province they vary according to circumstances. This is in many cases a necessity, and it would be injurious to reduce all to one uniform standard.

I give the rate as fixed by Government for the province of Madras, which may be taken as a fair example and as near the average for India as could well be given.

That the significance of these rates may be understood, I may give by as near an approximation as I can the values of the different standards as compared with those in this country.

A student for a B.A. degree is as nearly as possible on a level with the students for the same degree in the University of London. It is supposed to be as difficult of attainment as a B.A. with honors in Oxford or Cambridge.

The F.A., or First Arts, is obtainable in the middle of the four years' college course, but is not properly speaking a degree.

The matriculation or sixth class is equal to our high schools which prepare for matriculation in English colleges.

The fifth, fourth, third, second, and first classes correspond to our secondary or middle class schools, and are all designed to lead up to the university course.

English is taught in all these schools, and in the higher classes it becomes the *medium* of instruction as well as a subject of study.

By referring to Table III it will be found (Col. 6) that there are 66,384 children in the lowest form or schools of this class; 151,055 in the middle school (Col. 5); 57,901 in high schools (Col. 7); and 7,441 in colleges (Col. 3).

Below this class there are what are called *primary schools* (Col. 7), in which there are 1,893,528 pupils receiving elementary instruction; the vast proportion in the vernacular only, but a considerable number also a little English, preparatory to moving into the higher schools; and there are in some places scholarships open to promising boys in these schools to enable them to rise.

Monthly Fees in the Presidency of Madras.

Character of Institution.	Government Institutions.		Aided Institutions.	
	In Madras.	In Mofussil.	In Madras.	In Mofussil.
	Rs. An.	Rs. An.	Rs. An.	Rs. An.
Two B.A. classes in college.....	5 -	4 -	3 8	2 12
„ F.A. „	4 -	3 -	2 12	2 -
Matriculation or 6th class school	3 -	2 8	2 -	1 12
Fifth and fourth classes	2 8	2 -	1 12	1 8
Third class	1 8	1 -	1 -	- 12
Second „	1 -	- 12	- 12	- 8
First „	- 8	- 8	- 8	- 6

In primary schools the fees vary from 1 to 4 annas per month, according to the locality and character of the teaching.

For the class of indigenous schools no fees can be stated, but they can be learned from the evidence given before the Commission. For the sake of comparison I give the following table of fees in English and Scotch schools.*

The following table gives the total *expenditure* on education in all its branches. I give it as in the official report corresponding to the above table of receipts, though it is not so intelligible to the general reader as Table VIII, by Mr. Howell:—

TABLE X.—*Expenditure on Education in British India in the Year 1881.*
[Taken from "Statistical Abstract."]

Universities.	Colleges.	Normal and Technical Schools.	Secondary Schools, Boys and Girls.	Primary Schools.	
				Boys.	Girls.
Rs. 1,97,953	Rs. 15,10,102	Rs. 7,25,997	Rs. 41,11,627	Rs. 54,53,182	Rs. 8,91,812

Schools for European and other Foreign Races.	Direction and Inspection.	Scholarships.	Buildings and Miscellaneous.	Total.
Rs. 3,21,116	Rs. 16,94,983	Rs. 4,22,771	Rs. 8,29,840	Rs. 1,61,59,383

* *The Yearly Income, Expenditure, and Grant "in Day Schools in certain Classes and Localities in England."*

	Income per Scholar in Average Attendance from			Expenditure per Scholar in Average Attendance.			Grant Earned per Scholar in Average Attendance.	
	School Pence.	Voluntary Contributions.		For Salaries.	Total.			
	s.	d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	s.	d.
<i>Voluntary Schools—</i>								
Church of England	10	5 $\frac{3}{4}$	— 7 7 $\frac{3}{4}$	1 7 9 $\frac{1}{4}$	1 15 1 $\frac{3}{4}$	1 15 1 $\frac{3}{4}$	15	6 $\frac{3}{4}$
Wesleyan	15	10	— 2 7	1 8 5 $\frac{1}{4}$	1 15 2 $\frac{1}{2}$	1 15 2 $\frac{1}{2}$	16	2 $\frac{1}{2}$
Roman Catholic.....	8	8 $\frac{3}{4}$	— 6 9 $\frac{1}{4}$	1 1 6 $\frac{3}{4}$	1 10 8 $\frac{1}{2}$	1 10 8 $\frac{1}{2}$	15	5 $\frac{1}{2}$
British and Un- denominational }	13	2 $\frac{1}{4}$	— 6 1 $\frac{1}{4}$	1 8 6 $\frac{3}{4}$	1 16 3 $\frac{1}{2}$	1 16 3 $\frac{1}{2}$	16	— $\frac{1}{4}$
London	13	3 $\frac{3}{4}$	— 9 5	1 10 1 $\frac{1}{2}$	2 1 3	2 1 3	15	9 $\frac{1}{4}$
England and Wales..	11	— $\frac{1}{4}$	— 7 1	1 7 5 $\frac{1}{4}$	1 14 11 $\frac{1}{2}$	1 14 11 $\frac{1}{2}$	15	7 $\frac{3}{4}$
			Rates.					
<i>Board Schools—</i>								
Birmingham	6	5 $\frac{1}{2}$	— 16 5	1 10 — $\frac{1}{4}$	1 18 1 $\frac{3}{4}$	1 18 1 $\frac{3}{4}$	16	4 $\frac{3}{4}$
Bradford	15	8 $\frac{3}{4}$	— 15 10 $\frac{1}{4}$	1 15 10 $\frac{1}{4}$	2 6 6	2 6 6	15	11
Hull.....	8	8 $\frac{1}{4}$	— 4 5 $\frac{1}{2}$	1 4 11 $\frac{1}{4}$	1 9 11	1 9 11	16	2 $\frac{3}{4}$
Leeds	11	1 $\frac{1}{4}$	— 11 6 $\frac{3}{4}$	1 9 9 $\frac{1}{4}$	1 17 5 $\frac{1}{2}$	1 17 5 $\frac{1}{2}$	15	9
Liverpool	12	11 $\frac{1}{2}$	— 13 8 $\frac{1}{4}$	1 11 4 $\frac{3}{4}$	2 3 3 $\frac{1}{4}$	2 3 3 $\frac{1}{4}$	17	2
London	8	4 $\frac{1}{2}$	1 11 — $\frac{3}{4}$	2 3 2 $\frac{3}{4}$	2 15 10 $\frac{1}{2}$	2 15 10 $\frac{1}{2}$	16	8 $\frac{3}{4}$
Manchester.....	13	4 $\frac{3}{4}$	— 9 3 $\frac{1}{2}$	1 6 11 $\frac{1}{2}$	1 19 — $\frac{1}{4}$	1 19 — $\frac{1}{4}$	17	— $\frac{1}{4}$
Sheffield	12	11 $\frac{3}{4}$	— 9 7 $\frac{1}{4}$	1 7 11	1 17 5 $\frac{1}{2}$	1 17 5 $\frac{1}{2}$	16	5 $\frac{1}{4}$
England and Wales..	9	3 $\frac{1}{4}$	— 16 11 $\frac{1}{4}$	1 12 2 $\frac{3}{4}$	2 1 6	2 1 6	15	9 $\frac{3}{4}$

In addition to this unfair treatment of the ryots, we see that recently attention has been called to the fact that a large number of endowments in lands and other property for educational purposes of all kinds, but largely for the benefit of the poor, have been allowed in one way and another to lapse or be absorbed—a subject to which I am glad to see the Commission is directing attention.

VIII.—Universities and University Education.

Under this head I call attention to the way in which the higher education is unduly, and as we think injuriously, fostered—injurious alike to the spirit of the nation and the proper culture of its youth.

As has been seen from the despatch of 1854, it was the design of Government that the higher education, especially the collegiate course, should be left at as early a date as was expedient to local or voluntary effort, and that for the keeping up of the standard, universities were to be established in the principal cities, while Government would continue to encourage the highest culture by its patronage of successful graduates, for whom important posts in its service were to be the rewards.

These universities were formed on the model of the London University, with its affiliated colleges. They were *not to be teaching* but *examining* bodies, with the power of conferring degrees; and certain scholarships were also at their disposal.

These colleges were to be aided by liberal grants, and it was hoped endowed by the richer natives or the yearly contributions of societies or individuals.

At first, however, it was thought desirable to establish a few colleges *entirely supported by Government* as models, and while needful to stimulate education.

It is now contended that the time has arrived for Government to withdraw, as it from the first proposed to do, from *direct teaching*, and leave these colleges to be conducted and supported by local effort, for which it is thought the great presidency towns at least are fully ripe.

It is also thought by many experienced friends of India, that the present system has been forcing the higher education on false and mercenary grounds. These colleges were set on foot *professedly* for the purpose of raising up a class of men fitted for employment by Government in many of its departments, and a graduate of the university was at first almost sure of a good post.

The effect has been, that the higher education is sought, *not for its own sake, or even for literary or professional pursuits*, but specially

A friend kindly sends me a note of the latest returns of “The Cost of Elementary Education in Scotland :—From Fees, 12s.; from Local Rates, 12s.; “from Government Grant, 17s.; Total cost per head, 2l. 1s.”

and almost exclusively with a view to Government service, and it is only when a man has failed in obtaining this, his great aim, that he turns to other pursuits, often with a sense of dissatisfaction, if not under a feeling of having been deceived as well as disappointed. We do not say that this is the case with all. For some time young men having seen the futility of expecting Government employment, have at an early stage of their course directed their studies to the professions of law, medicine, engineering or other pursuits. But even in these professions hankering after Government employment.

To show how strong and progressive is the growth of the desire for education of the higher sort, we give the following tables from the Government abstracts. The first gives the returns for the first ten years, from the time the universities got into working order; the second gives the return for the last ten up to 1880.

TABLE XI.—*Statement Exhibiting the Results of the University Examinations for Matriculation or Entrance.*

	Calcutta.	Madras.	Bombay.
<i>Colleges—</i>			
Government	19	6	5
Independent	22	13	1
Total	41	19	6

Years ended	Candidates.	Passed.	Candidates.	Passed.	Candidates.	Passed.
<i>30th April—</i>						
1860	1,411	583	52	23	127	22
'61	808	415	80	48	42	14
'62	1,058	477	195	82	86	30
'63	1,114	477	252	105	134	30
'64	1,307	690	390	143	148	56
'65	1,396	702	565	223	241	109
'66	1,500	510	555	229	82	111
<i>31st March—</i>						
1867 (11 months)...	1,350	629	895	306	440	93
'68	1,507	814	1,069	338	539	163
'69	1,734	892	1,320	324	600	250
	13,185	6,189	5,573	1,821	2,439	878
	Degrees.					
1858-69	977	255	179	104	567	276
'68	777	384	388	141	143	57
'69	422	218	532	213	137	67
	2,176	857	1,099	458	847	400

Note.—The universities of Calcutta, Madras, and Bombay were incorporated in 1857 by Acts of Imperial Legislature, Nos. II, XXII, and XXVII. All are based on the model of the University of London, without rigorous uniformity of details being insisted upon.

TABLE XII.—*Result of Examinations at the Universities in India, for Entrance, Degrees, &c., in each of the Eleven undermentioned Official Years.*

Official Years ended 31st March.	Entrance.		First Arts Examination.		B. A.		Honours in Arts and M.A.		Law.		Medicine.		Civil Engineering.	
	Candidates.	Passed.	Candidates.	Passed.	Candidates.	Passed.	Candidates.	Passed.	Candidates.	Passed.	Candidates.	Passed.	Candidates.	Passed.
CALCUTTA UNIVERSITY.														
1870	1,730	817	520	225	210	98	32	24	130	92	68	52	8	5
'71	1,950	1,099	540	233	212	84	39	35	113	65	91	68	9	3
'72	1,902	767	507	204	232	100	32	24	111	63	117	59	13	2
'73	2,144	938	560	220	212	126	30	20	158	152	130	56	16	8
'74	2,544	848	539	305	212	92	57	32	230	125	168	75	21	3
'75	2,254	966	533	193	217	90	38	18	168	40	209	51	24	2
'76	2,373	838	575	182	281	73	38	24	71	55	245	92	20	10
'77	2,425	1,355	756	344	287	144	49	31	85	63	287	90	21	8
'78	2,720	1,166	791	253	228	68	62	28	62	30	227	118	34	11
'79	2,617	1,098	923	267	323	91	48	28	84	46	160	49	28	6
'80	1,996	767	909	261	262	90	48	29	89	48	182	96	26	—
Total for the 11 yrs. }	24,610	10,659	7,153	2,687	2,706	1,056	473	293	1,301	779	1,884	806	220	58
MADEAS UNIVERSITY.														
1870	1,200	401	531	220	50	34	5	5	88	15	—	—	2	—
'71	1,358	424	268	96	65	34	—	—	4	2	1	1	4	2
'72	1,419	492	205	97	131	65	1	1	9	6	—	—	2	—
'73	1,530	611	240	76	81	29	1	1	8	5	2	2	—	—
'74	1,704	626	285	125	88	50	1	1	26	13	4	4	4	1
'75	1,911	784	342	183	85	55	1	1	16	9	3	2	2	2
'76	2,164	662	401	187	107	67	2	1	18	8	3	3	5	3
'77	2,517	1,250	429	131	136	70	6	3	22	7	4	3	4	3
'78	2,495	807	516	191	157	52	4	—	26	11	9	8	4	2
'79	2,597	356	663	172	231	140	4	2	35	23	6	4	4	—
'80	3,309	1,094	582	295	175	85	7	2	31	4	12	10	8	5
Total for the 11 yrs. }	22,204	7,507	4,462	1,770	1,306	681	32	17	283	103	44	37	39	18
BOMBAY UNIVERSITY.														
1870	839	142	105	34	52	20	7	2	17	6	11	5	12	17
'71	901	142	136	44	61	13	4	2	14	13	16	7	21	10
'72	876	227	134	32	58	14	5	1	2	—	28	15	31	14
'73	909	378	99	24	56	22	6	5	6	1	28	19	29	19
'74	1,025	355	146	48	62	23	8	3	7	3	38	21	36	23
'75	1,115	262	213	74	69	30	9	2	11	2	51	25	39	17
'76	1,269	434	193	69	88	18	6	4	11	5	66	47	36	30
'77	1,154	203	176	29	92	40	4	2	16	3	60	30	35	29
'78	1,049	217	150	61	87	30	6	3	14	4	86	41	45	28
'79	932	261	133	57	93	42	7	3	19	6	76	43	44	34
'80	1,093	436	150	65	97	51	6	4	29	20	61	44	50	39
Total for the 11 yrs. }	11,162	3,057	1,635	537	815	303	68	31	146	63	521	297	378	260

The following gives the GRAND TOTAL from the beginning of the university system to 1880, the last return, published in 1882, including, *as in the earlier tables*, F.A., or First Arts, B.A., and professional degrees under the general head of DEGREES, although F.A. is not, properly speaking, a degree.

TABLE XIII.—*Exhibiting the Total Results of the University Examinations for Matriculations or Entrance in Calcutta, Madras, and Bombay.*

Years.	Calcutta.		Madras.		Bombay.		Grand Total of Three Universities.	
	Candidates.	Passed.	Candidates.	Passed.	Candidates	Passed.	Candidates.	Passed.
1860-80..	37,795	16,848	28,077	9,328	13,651	3,935	79,523	30,111
Degrees.								
'58-80..	15,913	6,539	7,265	3,084	4,410	1,891	27,588	11,514

I do not say that these numbers are excessive as compared with the population of India; but as aspirants for offices under Government, or even for lucrative employment of a literary or professional kind, they are far above the demand in the present condition of the country: and that all of them expect to make their literary studies a means to the attainment of a living is unquestionable. I do not consider it is discreditable, I mention it only as a fact. The strongest advocate for the present policy, Professor Duncan, of the Madras Presidency College, says, in his evidence before the Commission, "DURING MY TWELVE YEARS' EXPERIENCE I "HAVE HAD ONLY ONE YOUNG MAN WHO ATTENDED MY CLASSES SOLELY "FOR THE SAKE OF THE KNOWLEDGE AND CULTURE HE EXPECTED TO "ACQUIRE." Mr. Arthur Howell, in his report for Lord Mayo's Government in 1870, asks the following pregnant questions:—

"What becomes of all these highly educated young men whom "the university turns out every year? Are they, as in England, "absorbed into the channels of every-day life, with a satisfactory "or even perceptible result? Are they to be traced, as in England, "in a liberal and enlightened native press? Do native gentlemen, "like English gentlemen, return to their zemindaries from a "university career, to spread around them the reflex of the "enlightenment they have received themselves? Does the process "of highly educating a few and leaving the masses, tend to "increase or diminish the gulf between class and class? Are "there any indications of a decrease in crime or of a dawn of "intelligence in the agricultural classes? Such questions will "occur to any one who sees how the public expenditure on

“education is annually distributed, and how comparatively few are the recipients of the larger share of the State’s bounty.” Mr. Howell does not give the answer, because no satisfactory answer was possible.

The strongest evidence which we can give of the supply being far above the demand in this department, while it is so lamentably short of it in the lower departments of education, is that laid before the Commission by Mr. Duncan, the ablest opponent of any change in the educational policy which has led to such results. Mr. Duncan gives the following table to show that educated natives find sufficient and satisfactory employment on leaving college. He thus accounts for the EMPLOYMENT OF THE BACHELORS OF ARTS IN MADRAS. He says it is, though not perfect, “sufficiently accurate for his purpose.”

TABLE XIV.

Bachelors of Arts 31st March. 1882.	In Government Service.							Teachers in Aided and Private Schools.
	Judicial.	Revenue.	Educa- tional.	Engineer- ing.	Indian Medical Service.	Clerical.	Clerks under Rs. 100 per Mensem.	
971	118	36	90	4	3	1	96	118

Vakils.	Merchants.	Mirasidars.	In Service of Native States.	Of Inde- pendent Means.	Pensioners	Students at Profes- sional Colleges.	Total.	Occupation Unknown.
92	4	4	68	5	4	103	796	175

When we take into account what a B.A. degree in India really imports, we would ask any fair minded man to look over that table and judge if the work and rewards are such as might have been reasonably expected.

I asked a friend who had been for years a member of the Calcutta University senate, and frequently one of the examiners, and the following is his reply:—

“Dr. Cotton, the learned Bishop of Calcutta, stated in his charge (and he was a most competent judge on this point) that the B.A. examination of the Calcutta University was much harder than the ordinary examination for the same degree in the Universities of Oxford and Cambridge, and that the M.A. examination (for in Calcutta the securing of that degree is not a mere matter of course or the payment of a fee) was quite on a par with the honour examination of the home universities. He more especially referred to the examination in mathematics in Calcutta, and the honour B.A. examination in mathematics in Cambridge.”

It will be observed that only one-third of them have reached the great object of their ambition, and we may say their expectation—the Government service; and one-third of these have less than 120*l.* a-year.

But let any man compare this table with that which we have given above, and ask himself what has become of the 3,084 who took degrees in Madras (see Table XIII) during the last twenty-three years. Half of these, it is true, were only F.A.'s, but where are the others? What has become of 7,265 candidates for degrees, and what of the 9,328 undergraduates of the university, to say nothing of the 28,077 who failed in the entrance examination? The fact of failure in any of these examinations, after the efforts and sacrifices they have made, does not tend to promote contentment of mind, or satisfaction with the Government which had tempted them to study with a view to promotion, as well as provided the college to facilitate their doing so. There is no doubt that a large amount of discontent prevails amongst a large number of those who pass, and those who fail to do so; it may be unreasonable, but it is not the less unsatisfactory.

IX.—*Comparative Cost of Pupils in Government and Aided Schools and Colleges.*

The next thing to which I would call attention is the extravagant expenditure on the education of students in Government schools and colleges, as compared with those in aided colleges. This is clearly brought out in the following table, also from the able paper of Mr. Howell:—

TABLE XV.

Provinces.	Cost to Government of each Student, 1879-80.							
	Colleges.		Higher Schools.		Lower Schools.			
	Government.	Aided.	Government.	Aided.	Government.			Aided.
	Rs.	Rs.	Rs.	Rs.	Rs.	A.	P.	Rs. A. P.
1. Bengal	213	42	128	4	6	5	4	— 10 1
2. Madras	235	63	92	29	26	10	—	2 15 2
3. Bombay	361	50	37	9	2	—	11	2 10 2
4. N.W. provinces } and Oudh }	653	185	E. 81 V. 23	E. 31 V. 6	13	1	9	E. 12 3 10 V. 3 15 10
5. Punjab	552	—	59	31	E. 16	7	—	E. 24 8 —
6. Central provinces	291	—	38	34	E. 10	9	9	E. 12 5 7
					V. 6	6	2	V. 2 11 3
7. Burmah	—	—	171	15	E. 48	—	11	E. 10 1 9
					V. 18	4	5	V. — 14 11
8. Assam	—	—	E. 22 V. 8	E. 7 V. 5	—			2 6 6
9. Berar	—	—	109	—	E. 83	3	2	E. 31 — 2
					V. 5	10	2	V. 2 8 6
10. Coorg	—	—	—	—	V. 4	15	4	—

Note.—As half the number of pupils are in Bengal, where education is cheapest, and the vast proportion in aided schools, and two-thirds of remainder are in Bombay and Madras, also chiefly in aided schools, the average per head in the lower schools is not materially affected by the high rate in other provinces. The average for all India is less than 2*s.* a-head from Government grants.

I need not enlarge on the features of this table, they are sufficiently marked. The irregularity is striking. No two provinces are alike, either in the higher or lower departments. They show an utter want of system in the regulation of the grants, varying in the *lower* from Rs. 2 to Rs. 83 in Government schools, and from 10 annas to Rs. 24 in aided schools; but with one or two exceptions the Government schools cost a vast deal more than the aided ones: in some cases ten and even twenty times as much for each pupil in the same class of school.

The anomalies may be seen by comparing the cost to Government in India as compared with the cost in England. Taking the latter at 15s. 6 $\frac{3}{4}$ d. at the lowest, and 17s. 2d. as the highest per head, as per table in foot note, p. 256, we find some of the schools in India cost as much as 48s. and 62s. in the aided schools, and 96s. and even 166s. in those of Government. But these are rare cases, and we only refer to them to show the anomalies in the working of the system. The vast proportion cost the Government a mere trifle in the class of aided schools, as for example in Bengal, in which the larger number are found, where the cost to Government is only about 15d. per head, while in Government schools they cost over 12s.; and in the province of Madras, where the aided pupils cost Government a little under 6s., while the Government pupils cost it 52s. each.

The difference in the cost to Government of students in the "aided" and the Government colleges is not only very great, but from the largeness of the sums paid, even much greater in the aggregate. In Madras, it is four times; in Calcutta, five times; and in Bombay, seven times the cost in the Government that it is in the aided institutions. I take no notice of the extravagant cost of education in the north-western provinces, as that abnormal state of matters is now brought to an end by handing over the Government colleges to the administration of natives, who are subscribing liberally for its maintenance as an aided institution.

The disparity of cost between these two classes of colleges is much greater than it appears in the tables, if, instead of taking the average cost of all the institutions of each kind, we take the cost of separate institutions. By grouping them thus, the difference of cost of each is reduced in some and raised in others. If, for example, we take such an aided college as that of the General Assembly of the Church of Scotland in Calcutta, and compare it with some of the Government colleges, it is found that the pupils in the latter cost twenty or even thirty times as much; though in the presidency college they do not cost more than five or six times the sum.

The best illustrations we can give of the needless extravagance

of the outlay on Government colleges is found in Madras, where there is no question as to the equality of the two institutions in that city. The Christian college, which was gradually developed from a high school, which was in existence there before the Government college was set up, has for years competed with equal and sometimes greater success than its rival for the highest honours of the university. It has repeatedly taken the highest place in the quality, though not in the number, of its graduates; and for three years running has carried off the much coveted gold medal in the science department. Instead of giving my own figures, I shall give those laid, by the present Director of Public Instruction for the Presidency, before the Government, and transmitted along with an important case of appeal to the Secretary of State for India.

In recommending a more liberal treatment of aided colleges, the Director, Mr. Grigg, showed a freedom from official routine as refreshing as it is rare, and proposed to reverse the decision of his predecessor, who had reduced the "grant" at a period of highest efficiency in these institutions. At the time he wrote, the pupils in the Christian college only cost Government Rs. 25 per annum, while those of the presidency college cost it Rs. 307; and as not half the number pass the F.A. examination, and only the half of those pass the B.A., he very naturally estimates the cost of the *finished* student before he is fit for Government service. He might have shown the cost to be far more than he makes it, if he had taken the cost of the graduate at the earlier stages of his studies. He puts it thus:—

"23. But it may be urged that this arrangement would be too expensive to the State. This question can only be answered by reference to the sum which Government pays in the presidency college for the education of graduates. This, according to the returns, was Rs. 56,206, or Rs. 70,320 if 25 per cent. for the authorised pension liability is added, but leaving out of account capital sunk in buildings, viz., Rs. 2,50,000. The university course extends over four years; consequently the present cost to the State of each graduate educated at this college is Rs. 1,800; and if the fact be taken into consideration that probably not more than 50 per cent. of the matriculated students who continue their studies for the degree examination pass the first examination in arts, and not more than 50 per cent. of these finally obtain a degree, the real cost to the State may be estimated roughly at Rs. 7,200 for each.

"24. Now, how would the matter stand in the hypothetical case given above. The maximum grant claimable is Rs. 800 or Rs. 9,600 per annum. As there are 200 students, this gives the

“ annual cost to Government for each as Rs. 48, or a total cost for
 “ the four years’ course of Rs. 192, and if this be quadrupled to
 “ allow for 50 per cent. of failures in the F.A., and 50 per cent. in
 “ the B.A., examinations, the total cost to the State is only Rs. 768,
 “ against Rs. 7,200 at the presidency college, that is, by one agency
 “ the State pays for practically the same article nearly ten times as
 “ much as for the other.”

The advocates of the transference of Government colleges to local management, according to the rules of the Education Despatch of 1854, have been most unjustly charged with a design to get these colleges handed over to missionary societies, or to get them out of the way in order that the missionaries might have the field entirely to themselves.

Nothing could be further from the aims or wishes of those who originated and have carried on this movement; and from the part I have taken in it, I can speak with certainty.

It has been declared publicly and officially, that they would regard any action of the Government giving patronage or special advantages to missionary institutions, or that might even seem to require the youth of India either to attend missionary colleges or forego the advantages of the higher educations, as a *gross injustice* to the people of India, and a *great injury* to the cause of missions. It would give the former a just ground of complaint against the Government, and would put the latter in a false position, ruinous to their influence over the minds and hearts of the natives of India. I never heard of a missionary in India, or a society at home, that would accept such a position.

Equally groundless is the charge that there is any desire to lower the character of the higher education, or the opportunities for its acquisition. The rule laid down from the first only applies to places in which the people are capable of taking the management of high schools and colleges into their own hands with advantage to education as well as to themselves. It is as follows:—

“THE GRADUAL WITHDRAWAL BY GOVERNMENT FROM *direct* TEACHING
 “ IN COLLEGES AND HIGH SCHOOLS WHEREVER THE DESIRE FOR THE
 “ HIGHER EDUCATION IS SO FAR DEVELOPED AS TO GIVE A REASONABLE
 “ GUARANTEE THAT IT WILL BE MAINTAINED WITH THE ASSISTANCE OF
 “ GRANTS-IN-AID, AND THE INDEPENDENT EFFORTS OF THE NATIVES,
 “ AND OTHERS INTERESTED IN THEIR WELFARE, AS LAID DOWN IN
 “ PARAS. 52, 61, 62, AND 86.”

X.—*Adaptation of Education to the Wants of the Country.*

The most unsatisfactory feature of our collegiate system is, that with all our extravagant outlay, and that at the cost of neglecting

and starving the primary education, WE HAVE NOT SUCCEEDED IN GETTING THE MOST IMPORTANT CLASSES IN THE COUNTRY TO SEND THEIR CHILDREN TO OUR HIGH SCHOOLS AND COLLEGES.

I cannot put this better than I did lately in a "Reply" addressed to the Maharajah of Travancore, who has been led to write on this subject. Amongst other things I said:—

"It was found, after a quarter of a century's experience, that Government colleges had signally failed to gain the confidence of the highest classes of the natives of India. In these circumstances we thought it full time to try some new departure in our system. The fact is admitted on all hands that the native nobility and the wealthy classes of India hold aloof from our collegiate course. The exceptions are so few as only to confirm the rule. Your Highness said, in your speech before the Kumbakonam College in March last, '*Western culture can hardly be said to have yet reached our rajahs, princes, zemindars, and generally the noble-men of the country.*' In a rejoinder to my reply, the Maharajah in denying that the religious question had anything to do with this state of matters,' says, 'The reason why the Hindoo and Mohamadan chiefs do not send their youths to ordinary Government schools and colleges, is not that the Vedas and Koran are not taught there, but because they do not wish their children to herd with common boys, and run the risk of losing their gentility and learning vulgarity;' a reason which may satisfy a disciple of the modern school, but will not account for the absence of the children of the old orthodox type. The Hon. Kristodas Pal, C.I.E., from his talents and experience a most competent witness, in his evidence before the Commission in Calcutta, asserts, on the strength of careful statistics, that '*whilst less than 5 per cent. of our students belong to families worth incomes of Rs. 200 a month and upwards, nearly 50 per cent. belong to families with incomes not exceeding Rs. 100 a month. . . . Out of fifty notoriously wealthy families resident in Calcutta and its suburbs, I find that only four or five are represented in our class rooms, whilst the holders of junior and senior scholarships belong almost entirely to families with incomes of less than Rs. 200 a month.*'

"Whatever reasons may be assigned for this fact, its deep significance cannot be overlooked by statesmen and philanthropists. That the classes who have for centuries been the rulers or administrators of India, and who have the largest stake in the country, should be either shut out or shut themselves out from taking the places they are best fitted to occupy in the civil appointments we so earnestly desire to see filled by natives, is a grave injury to the State, if not an injustice to them. Civil appointments are only open to the successful graduates of our

“universities. The keeping up of our costly Government colleges is professedly for the purpose of securing the best men for Government service, and if we not only give facilities, but bestow scholarships, by which the poor may rise to high offices in the State, we are bound, in the cause of expediency and justice, to see that no obstacle is put in the way of the sons of princes and nobles taking their share of the duties of the State formerly enjoyed by their ancestors, and of the honours and rewards which Government can bestow.

“By our present system we are turning the order of society upside down. We have no wish to withdraw the facilities for the education and promotion of the lower classes, but we deprecate the exclusion of the higher and better classes of society.

“We know that the Government has no wish to exclude any class, and that our colleges are open to all. We are aware that the blame may be cast on those who decline to avail themselves of the opportunities. We know that your Highness and the Hon. Kristodas Pal, with many others, make the fact of so few having as yet taken advantage of our western culture an argument for continuing our present system of Government colleges. But to us it appears more probable that there are some faults in our present arrangements. It seems to us that this state of matters having continued so long without any marked or adequate improvement, indicates a need for some changes which might remove objections which have kept parties outside of our western culture and our ‘Civil Service’—that at least *there was reasonable ground for inquiry on the subject.*”

One most important part of the Indian community, the late rulers of the country, our Mohammadan fellow subjects, are practically shut out from posts of honour and usefulness in any department of Government service.

Since *Persian* was abolished as the language of the governing class in 1837, the Mohammadans have fallen completely into the background. They have not shown themselves capable of adapting themselves to the altered conditions like the pliable Bengali, who has supplanted his more rigid fellow subject. In 1871, Dr., now the Hon. Mr. Hunter, the president of the Commission on Education, wrote, “The proportion of Mohammadans to Hindus in *gazetted appointments* is only 1 in 7,” and since then it has fallen as low as 1 in 10, and in inferior appointments the absence of Mohammadans is equally marked.

In the days of Wellesley and Hastings they were largely employed in the highest offices.

I cannot here give the many reasons for this unsatisfactory state of matters; poverty may have something to do with it, but it is

well known that the class who have chiefly superseded them is the poor class of "begging Brahmins."

In the August number of the "Nineteenth Century," from which these figures are taken, a table is given showing first, that of 2,007 gazetted appointments, 1,080 fell to Christians, 850 to Hindoos, and only 77 to Mohammadans, and in inferior appointments in Calcutta 3,143 Hindoos are employed, and only 416 Mohammadans. But in similar appointments in the Mofussil, where the physical and mental superiority of the Mohammadan race stands out in bold contrast with rural populations, the disparity is on the other side, if we keep in mind the difference of their numbers. There are 213 Mohammadans to 508 appointments, but in this case both are far outstripped by Christian employés, who number 3,065.

The following table, taken from the evidence of the Hon. Kristodas Pal, C.I.E., now a member of the legislative council, shows how completely Government colleges fail to gain the confidence of the richer classes even in a city like Calcutta, where the advantages of western culture have been so long enjoyed, and where the prejudices of the natives are far from being so strong as they are in other parts of India. He told the Commission that his statistics were collected by Mr. Sutcliffe, when he was principal of the Presidency College.

Table showing the Income of Parents of the Pupils at the Presidency College, Calcutta.

Amount of Monthly Income.	First Year Class.	Second Year Class.	Third Year Class.	Fourth Year Class.
Rs. 5,000 and upwards	—	1	1	—
„ 4,000 and less than 5,000....	—	1	—	—
„ 3,000 „ 4,000....	3	2	—	—
„ 2,500 „ 3,000....	1	1	—	1
„ 2,000 „ 2,500....	—	—	—	1
„ 1,500 „ 2,000....	2	4	—	—
„ 1,000 „ 1,500....	6	7	1	4
„ 500 „ 1,000....	5	10	3	2
„ 200 „ 500....	6	16	8	3
„ 100 „ 200....	15	23	6	10
Below Rs. 100....	58	40	19	20
Total	96	105	38	41

The two tables, which follow are important as showing that while the richer classes as a rule prefer the presidency colleges, as more aristocratic and under the wing of the State, there is no material difference in the *class* or *social position* of those who attend the aided, and Government colleges, and that, but for fashion, or the hope of patronage from being in Government colleges, there is no reason for keeping up such costly institutions when others are

doing the same work at a fourth part of the cost. They are taken from Mr. Howell's report previously referred to.

	Social Position of the Parents. Percentage on Total of Pupils.					
	Zemindars, Talookdars, and persons of Independent Income.	Merchants, Bankers, Banians, and Brokers.	Profes- sional Persons.	Govern- ment Servants and Pensioners.	Shop- keepers.	Others.
Government colleges....	30·6	8·6	9·6	31·8	1·3	18·1
Private colleges	26·6	14·4	11·2	23·2	1·4	23·2

For Madras it was :—

	Social Position of Parents. Percentage of Students.					
	Zemindars, Talookdars, and persons of Independent Income.	Merchants, Bankers, Banians, and Brokers.	Profes- sional Persons.	Govern- ment Servants and Pensioners.	Shop- keepers.	Others.
Government colleges	28·0	9·0	15·4	28·6	1·7	16·0
Private colleges	25·0	13·3	10·8	22·3	2·3	26·2

On these tables the Under Secretary of Government remarks: "As far, therefore, as this classification can be depended upon, it would appear that there is no great difference in social position between the students attending Government and private colleges. And this is probably the case, but the more wealthy members of each class frequent the Government colleges, while the poorer students resort to the aided colleges."

The entire control of direct teaching in Government colleges hinders the natural development of education and its adaptation to the wants of the people, which vary in different districts of the country.

There is too much of the mere importation of English culture and English methods from England to India, without that regard to the peculiar character and varying necessities of the natives which is essential to the highest success. As an illustration of the rigidity of the system, we have only to refer to a fact to which Mr. Howell called attention in his report to Government in 1870. He informs us, "*that the course of study for examination in the university of Bombay was modelled on that of Oxford, and that of Calcutta on the Cambridge principle, because the first principal of Bombay Presidency College was an Oxford graduate, and the first principal of Calcutta College was from Cambridge.*"

Lord Ripon has repeatedly referred to this rigidity of our system, and expressed himself in favour of greater liberty; and by establishing the new university in the Punjab, he has given Government sanction in a very practical form. The object of this new university is to promote the introduction of occidental learning into India by means of the oriental languages, and not, as has been too exclusively attempted, by presenting them to the natives in the costume of the English tongue, which can no more be accepted universally and at once than the English constitution. English will be studied more on the footing of the classical languages of the country, but will not be made an essential condition to the attainment of degrees or posts of responsibility and good pay.

To show the need of adaptation, I give below a part of a memorial presented to the Hon. Mr. Hunter, the President of the Commission, when in Bombay, as it appeared in a Bombay paper:—

“ The Merchants’ Memorial.

“ Mr. Jacob also introduced a representative of the merchants of Bombay.

“ Mr. Vizbhooan Atmaram read a memorial from bankers, shroffs, merchants, and traders carrying on business in Bombay. “ The following passages occur in the memorial :—The memorialists “ bring to your notice a pressing want they have of late years felt “ in connection with their establishment of clerks, and the general “ management of their banking and mercantile affairs, both in “ Bombay and up-country. The want they refer to is that of “ clerks and accountants thoroughly trained in the native and “ European systems of banking, bookkeeping, casting up of mercantile accounts, and carrying on mercantile correspondence, and “ of men qualified by their education to take up the posts of “ managers of banking or mercantile institutions. They find it “ difficult every year to replace old, dead, or dismissed hands by “ men fit to take up at once the active duties of a mehta (an “ accountant or bookkeeper), a killadar (cashkeeper), and a “ moonim (manager). A few years back it was usual to recruit “ such persons from Gujerat, but latterly your memorialists have “ found that such recruits are not easily obtainable even on tempting salaries, owing, they believe, partly to the falling off, in “ Gujerat and elsewhere in this presidency, in the number of “ indigenous schools which aim at imparting such instruction to “ their pupils as is useful to them in daily life, and partly, or “ rather in a great measure, to the fact of the present schools for “ primary and secondary education, Government or aided, having “ failed to give instruction in subjects purely of a practical “ character.”

We doubt not the following could be paralleled in some individual cases in this country; but let it be read in the light of the complaint of the inspector, that out of 700 students only 128 answered the questions correctly, and we shall be disposed to go much further in throwing the blame on the question being put and answered in a foreign tongue.

Mr. Porter, who was one of the ablest and most experienced Examiners in Physics, thus writes:—

“The mark-book itself, without the aid of any comment, tells a striking enough tale that of the 2,500 candidates there were *over a thousand that got no marks at all*,” adding those who never sent up their papers, he says, “in round numbers there were 1,100 candidates who showed no knowledge numerically appreciable in any of the points contained in my questions.”

To show that his questions were not difficult, he gives the following as an example:—“State how the two points first marked on a thermometer are obtained?”

After showing how the question had been answered in their primer in a very simple and intelligible way, he shows what the answers were of the 532 who failed out of 700:—

“The most numerous class,” he says, “evaded the difficulty by writing out the whole (from memory), beginning with the glass blower, and ending with the acid. In the latter case when the part I wanted was correctly given the answer was accepted, and all such answers were included in the 128 already mentioned. I have here incidentally touched on one of the commonest faults of students of this standing, an inability to see the point of a question, leading to much diffuse and superfluous writing. The majority of matriculation candidates possess the property which comically enough they are so fond of ascribing to air, ‘an intense desire to fill any vacant space.’”

“To return to the answers. Some are amusing from their vagueness. The following are specimens:—‘When the weather is very cold, we take one point; when the heat is increased to the highest, we take the other.’ ‘Take it to the coldest place in the earth for the one point; take it to the warm country for the other.’ ‘The people near the equator founded the one point; the people of the cold country founded the other.’”

“Sometimes the boiling point is obtained by putting the tube in a ‘bright excessive fire,’ by ‘exposing it to the rays of the sun,’ by ‘constant application of heat,’ or by ‘heating the mercury till it boils.’ The freezing point by ‘placing it out of the rays of the sun,’ by ‘constant application of cold,’ by ‘taking it to the top of a mountain,’ or by ‘cooling the mercury till it freezes.’ Another class effect the task with less trouble in some of the fol-

“lowing ways:—‘Mark one point at the bottom and another at the top,’ ‘coat the tube with wax and draw marks with the needle ‘at proper places, and then plunge in hydrofluoric acid,’ ‘take a ‘glass tube and scratch with a needle a line at a hundred ‘steps, &c.,’ wax and acid as before. I notice that boys who use ‘no ceremony in scratching the marks are always very strict about ‘the acid. Some indeed leave the whole work to the acid as ‘thus:—‘If you dip the thermometer in a solution of hydrogen ‘gas, you will obtain the first two points.’ The wildest answer I ‘received was the following, to which I see no clue in any words ‘of the primer:—‘The two points are obtained by Sir Stamford ‘Raleigh when he was in Ireland.’ ”

The above illustration is chosen out of many as an example of the difficulty under which Indian youths labour in the use of books prepared for English students, as well as of the superficial character of much of the education given.

I close with the following from the pen of Dr. Monier Williams, Boden Professor of Sanskrit in the University of Oxford. It points out what I have long felt was the great want of Indian education, *the development of the manhood of the youth of India* BY THE HEALTHY CULTIVATION OF THEIR PHYSICAL, MENTAL, AND MORAL NATURE :—

“With regard to languages, I cannot help thinking that a great “mistake is committed—a mistake which calls for the immediate “consideration of the directors of public instruction. We do not “sufficiently encourage the vernaculars. The classical languages “receive due respect and attention, but the vernacular dialects of “India, which ought to be stimulated to draw fresh vitality and “energy from Sanskrit, are everywhere showing signs of serious “deterioration. Be it observed, however, that they are by no “means dying out. It would be simple folly to suppose that we “can impose English on 240 millions of people.”—“Modern India,” p. 219.

On the effects of our higher education on the youth of India, instead of giving my own opinion I give that of Dr. Monier Williams. In his “Modern India,” after a personal and careful survey of the field, he says :—“We in England sometimes require “to be reminded that the duty of an educator ought to be in “accordance with the etymology of the word—that it should “consist in gently drawing out rather than in roughly hammering “in. Indian educators of Indian children are still more forgetful “of this truth. Nor do they sufficiently bear in mind that the “most valuable knowledge is that which is self-acquired when the “faculties are matured, and that teachers are doing their business “more effectively when they are teaching their pupils to be their

“own future self-teachers. I am afraid our Indian colleges and schools are turning out more well-informed than well-formed men, more free thinkers than wise thinkers, more silly sceptics than honest inquirers, more glib talkers than accurate writers, more political agitators than useful citizens.”

This is stronger language than I have ever ventured to use, and but for the position and character of the writer I would not have quoted it. Few men have so good authority for speaking on such a subject, and none can question Dr. Williams's deep and intelligent interest in the welfare of the youth of India. I gladly acknowledge the important service which has been rendered by the Government colleges, not only in the intellectual work they have done, but in the elevation of the moral tone of a large number of the youth. It was impossible for those susceptible youths to come into daily contact with English gentlemen of culture, and in most cases men of high character, without being inspired with better thoughts and a deeper sense of moral responsibility, and especially a regard for honour and justice and truth. But even in these respects there is room for great improvement. The better thoughts and feelings are too often overcome by temptations which wreck the most hopeful of them from the want of stable principles and an authoritative standard. The system tends to substitute the imitation of the English character for the cultivation of a good conscience. An illustration will explain my meaning. An undergraduate came to the principal of the Calcutta University in a towering passion, and demanded redress for his injured feelings, because he had been called a “liar” by a fellow student. The principal observed, with a smile, “I did not think that it was thought a disgrace to be called a liar,” using the Bengali word for the epithet. “True,” said the youth, with increasing rage, “if he had called me a liar in Bengali I would have laughed at it; but, Sir, he called me a liar in English, and I won't stand it.”

We do not despise even this dawn of a Saxon conscience in an Indian youth.

APPENDIX A.—Aggregate Annual Income and Expenditure of Schools in England.

Denominations.	Income.										Rate of Income per Scholar in Average Attendance (Calculated on Complete Annual Returns only).						
	Endowment.	School Board Rates.	Voluntary Contributions.	School Pence.				Government Grant (1879-80).	Other Sources.	Total.							
				Paid by Scholars.		Paid by Guardians.											
				£	s. d.	£	s. d.				£	s. d.	£	s. d.	£	s. d.	
Schools connected with National Society of England	126,451	1 1	—	582,382	3 2	765,310	17 7	19,871	2 3*	1,133,291	3 8	31,418	19 1	2,658,725	6 10	1 15 3	
Wesleyan schools	538	14 10	—	15,514	13 5	94,315	14 2	1,373	11 3†	97,086	14 11	3,875	15 5	212,705	4 —	1 15 ¾	
Roman Catholic schools	2,025	8 2	—	52,027	19 10	62,657	—	5,363	6 ¼	114,461	7 6	835	17 10	237,380	19 4	1 10 8½	
British, Undenominational, and other schools	15,800	4 8	—	76,750	12 5	161,343	— 2	2,474	18 10§	191,275	14 9	6,766	1 9	454,410	12 7	1 16 4½	
School Board schools	3,208	5 5	738,737	3 7	2,260	1 8	390,491	3 7	6,452	15 6||	619,550	— 7	23,918	3 8	1,786,617	14 —	2 1 7
Total	148,033	14 2	738,737	3 7	728,935	10 6	1,474,117	15 6	35,535	13 10	2,155,655	1 5	68,814	17 9	5,349,839	16 9	1 16 11½
Denominations.	Expenditure.										Rate of Expenditure per Scholar in Average Attendance (Calculated on Complete Annual Returns only).		Number of Voluntary Subscribers.			Total.	
	Salaries.	Books and Apparatus.	Miscellaneous.	Total.		Of 5l. and upwards.	Of 1l. and upwards.	Of less than 1l.									
				£	s. d.				£	s. d.							
				£	s. d.				£	s. d.	£	s. d.	£	s. d.			
Schools connected with National Society or Church of England	9,091,832	14 2	143,093	15 3	414,641	7 1	2,619,567	16 6	1 15 1½	21,091	95,263	104,783	221,137				
Wesleyan schools	172,389	18 8	10,955	1 4	30,033	2 0	213,378	2 0	1 15 2½	190	1,470	3,396	5,056				
Roman Catholic schools	166,965	5 8	15,786	6 8	55,188	8 11	237,940	1 3	1 10 8½	1,112	2,979	11,605	15,696				
British, Undenominational, and other schools	355,551	17 0	25,135	18 4	72,268	2 4	452,955	17 8	1 16 3½	1,535	9,143	17,326	28,004				
School Board schools	1,380,121	10 4	122,936	16 5	280,078	9 0	1,783,136	15 9	2 1 6	24	159	61	244				
Total	4,166,861	5 10	317,907	18 0	852,209	9 4	5,336,978	13 2	1 16 10½	23,952	109,014	137,171	270,137				

* On account of 63,357 scholars. † On account of 4,425 scholars. ‡ On account of 17,364 scholars. § On account of 5,508 scholars. || On account of 25,157 scholars.

* On account of 63,357 scholars.

† On account of 4,455 scholars.

‡ On account of 17,364 scholars.

§ On account of 3,508 scholars.

|| On account of 25,157 scholars.

DISCUSSION *on the* REV. JAMES JOHNSTON'S PAPER.[R. GIFFEN, ESQ. (*President*) *in the Chair.*]

PROFESSOR LEONE LEVI said several facts stood out very prominently from the paper just read, namely, first, that the attention of the Indian Government had not been given to education to the extent that it deserved; and second, that the expenditure devoted to this purpose formed a much smaller proportion than was the case in this country; third, that the persons instructed belonged entirely to the male population, to the almost absolute exclusion of the females; and fourth, that the largest proportion of the expenditure was devoted to superior instead of to popular education. The following comparisons brought this out very prominently. In India, out of a total expenditure of 76,500,000*l.*, the estimate for last year was under 1,000,000*l.* for educational purposes, giving a proportion of 1·30 per cent. In the United Kingdom, with a total expenditure of 85,000,000*l.*, the imperial expenditure for education was 4,500,000*l.*, or a proportion of 5·26 per cent. In the United Kingdom, out of the 4,500,000*l.* devoted to education, 3,800,000*l.*, or 84 per cent., was applied to elementary education, whereas in India, out of 1,000,000*l.*, only 118,000*l.* were devoted to elementary education, or only 11 per cent. Whereas, therefore, the bulk of the Government expenditure in this country was on behalf of the masses of the people, the bulk of the Government expenditure on education in India was on behalf of secondary and higher instruction, or of the middle and higher classes. The disproportion of females was very notable. In this country the numbers of boys and girls under education were nearly equal; in India, on the contrary, out of 2,000,000 under education, 1,800,000 were boys; the abandonment of the girls to ignorance, whatever was the cause, being very sensible and extraordinary. They had before them the deplorable fact that there were 30 millions of people in India unprovided with education of any kind by the State, and these must constitute a great mass of ignorance which might occasion difficulty in government. In this country they held that education was a great element of safety, progress, and advancement, both social, political, and economical, and if this element was wanting in India, the consequence would be that the country must be kept far behind for a very considerable time to come.

General Sir HENRY NORMAN said Mr. Johnston's address had been very interesting, and afforded great scope for reflection, but they must recollect that at the present moment the whole of this subject was being most exhaustively inquired into by a tribunal which appeared to command Mr. Johnston's entire confidence, presided over by Dr. Hunter, and on which all the most eminent authorities connected with education in India were serving. With reference to the comparison made between the expenditure in

England and India, he should like to know how much was expended in England twenty years ago in proportion to the imperial revenue. Education was now compulsory in England; there was no such thing in India; the country was not ripe for it, and they had not the means of carrying it out. Then again as to the number of people who were educated, they must remember that there were an enormous number of indigenous schools all over India in which the people found an education suited to their wants, and which were not aided by the Government. Taking England as it was fifty years ago, there were as many natives in India educated up to their requirements as there were then in England. Now they had a comparatively perfect system of education in this country which compelled everybody to go to school, but in India that was impossible, and might be so for many years to come. Practically the females in India were not educated at all. Great efforts were being made to educate them by means of Zenana missions and institutions of that kind, but still when it was remembered that there were 100 millions of females in India, that agency for many years to come could produce very little results. He agreed that there was too much expended for higher education, and people if they wanted this higher education ought to pay for it themselves. The observations that these higher colleges turned out people who, failing to get Government employ, became political agitators and so forth, would, he was afraid, apply equally to all the colleges whether aided or not, for certainly some of the political agitators in Calcutta had not come from Government colleges. If a large number of natives were educated to a high extent, there being no scope for them as there was in England, they would infallibly become agitators, and some of them possibly dangerous characters to British rule. He did not mean to say that that was any argument against high education, but any argument that applied to Government colleges in that respect would also apply to the aided colleges. He hoped they would see a good deal of improvement as the result of the inquiry of the Commission, but too much must not be expected at once, and it must not be supposed that it would end in an expenditure on education in India proportionate to the amount now expended in England.

Mr. T. B. KIRKHAM said he would avail himself of the courteous invitation to visitors, to offer a word or two of respectful criticism on the exceedingly interesting paper which they had just heard read. If his remarks were exclusively confined to criticism, it was not because he did not appreciate the mass of information and the valuable views put forward in the paper, but simply because he believed criticism was expected, as being the most useful sort of comment. What they had been asked to do was to abolish Government colleges altogether, or else to transfer them to local and private management. Why were they asked to do this? First because the author seemed to say in one place that the education was bad. He quoted Mr. Porter, an examiner of Madras, who stated that out of 1,000 candidates a very large proportion got no marks at all; and he also quoted some exceedingly ridiculous

answers to prove apparently that the instruction was absolutely worthless. At another part of the paper, however, he said the B.A. degree was equal to that of London. He (Mr. Kirkham) did not quite understand that; there seemed to be a want of steadiness of view of the subject. To quote in a paper of such pretensions a passing remark of Mr. Porter, one single examiner in one single university, was altogether inadequate as an argument for a great change of policy. The fact was that these amusing answers to examination questions were perfectly well known to be stock matter in all examiners' reports. Only the other day a Board School examiner quoted a child as answering the question "Who was Esau?" "Esau was a writer of fables, who sold his copyright for a bottle of potash." Mr. Johnston would hardly consider that as a conclusive argument against teaching scripture history or the elements of chemistry in schools. Another reason Mr. Johnston gave was because the expenditure on higher education was out of all proportion to the expenditure on primary education. That of course would be a very good argument for making some change. He however was very much surprised to hear that the expenditure on higher education was three times that on primary education, and with all deference to the authorities quoted, he did not think such a statement would bear investigation. The only part of India with which he was practically acquainted was the presidency of Bombay, and he could confidently state that there the expenditure on primary education was far greater than that on higher education. If this disproportion really existed in any province, it was a good reason for doing something, and the natural inference was that the expenditure on primary education should be forthwith increased. He would cordially support the observation made by Professor Leone Levi, that the expenditure on education in India was almost scandalously low, less than 1 per cent. of the whole revenues of India. There was, however, one matter which must be carefully kept in mind in comparing the expenditure on education in India and in England, and on higher and elementary instruction. In mentioning the educational expenditure in England, they left out of question altogether the immense revenues of the Universities of Oxford and Cambridge, and which for all practical purposes were public funds. In India there was absolutely nothing of the kind, and if what was done in the way of higher education was not done by the State, it would not be done at all. If therefore a statistician were to take into account the enormous wealth accumulated in Oxford and Cambridge, the comparison would not perhaps be altogether against India. He did not quite understand Mr. Johnston's contention as to the indigenous schools, whether they were good and ought to be supported; but at any rate this tremendous fact stood out in the whole of his paper, that whereas in England they were able to calculate children at so much per cent., in India they must take the thousand in order to talk about educational statistics at all. There was room in India then for all classes of schools, and therefore he could not see how Mr. Johnston's facts at all led to the conclusion that Government should withdraw from the field of

education. Another measure of comparison employed was "cost to Government," and they had been told that the cost to Government in aided schools was very much less than in Government schools, the inference being that Government should withdraw because it could get the same article at a lower rate in the aided school. A moment's examination would show that that was a great fallacy. What did they mean by the cost to Government? No doubt the cost to Government in a Government school was the whole cost of educating the child. The cost to Government in an aided school was the grant in aid, but that was not the cost of educating the child; the cost of educating the child was the grant in aid *plus* all the contributions from England, or from benevolent persons, or from the funded sums of money, and so on. Mr. Johnston's argument was that the Government should withdraw from the field of education because it might get the same article in aided schools, but how was that consistent with what he showed of the immense need for schools of all kinds? Would he guarantee that if the Government schools were closed the same article would be forthcoming in the same quantities? If so he must be prepared to tell them that England had not yet been sufficiently tapped of the superfluous contributions which people here were prepared to contribute to education in India. He (Mr. Kirkham) believed from his experience of Bombay, that if the Government schools were all closed to-morrow, the aided schools would remain in number very much what they are at present. The proposition, therefore, practically came to this, to close one agency which was doing a great deal of good, without any clear prospect that it would be supplied in other directions. With regard to the words which Mr. Johnston read with so much solemnity from Professor Monier Williams about their Indian schools turning out more "well-informed than well-formed men, more free thinkers than wise thinkers, more silly sceptics than honest inquirers," and so on, was not that true of all colleges, and all places of education? It was the same complaint which they heard constantly even of the English universities, and every one knew that inaccurate thinkers were always in the majority. On the whole he could not think that Mr. Johnston had made out a case for the tremendous change which he advocated.

General R. MACLAGAN said Mr. Johnston had referred to the great extent of education of a certain kind amongst all classes of people in India in the early part of the century, and to the interesting report by Mr. Adam on indigenous schools in the time of Lord William Bentinck—a report which has not lost its interest even now. They could not ascertain very distinctly the character of the indigenous education at that time in the parts of the country under native rulers, but they could perhaps get some idea of its nature by looking at some of the native States in the present day. That afternoon, by mail from India, he had received some information regarding education in one of those native States—the State of Márwár in Rájputana. At the capital city, Jódpur, there is a good school maintained by the Maharaja, in which English is

taught as well as Persian, Urdu, and Hindi languages, with arithmetic and a little geography. The State was divided into twenty-two districts, and at the head-quarters of each of those districts there is a school in which a little Hindi and arithmetic are taught, with writing in the local (Márwári) character. In these schools no books are used. In one of the districts which is under British supervision there are two towns at which there is a school of a higher class, teaching a little history and geography, besides the Urdu and Hindi languages and arithmetic, which is universal. Besides these, there are everywhere indigenous schools of a lower class, in which scarcely anything is taught beyond a little writing, mental arithmetic, and notation. Education will thus appear to be very general. Then the first effect of endeavouring to introduce education of a higher kind is this: the parents, having little idea of the use of higher education, did not care to let their children give up the time required; they wanted their services in the field and in various occupations at home. The result is a decrease, for a time, of the number of pupils with increased outlay on the schools. Mr. Johnston had noticed the system of educational rates. People ordinarily valued what they had to pay for, and they would willingly pay for what they valued. It is important to maintain the system of paying for education. With regard to the general statement that the Government had expended an undue proportion of its educational funds on the higher education, to the neglect of the lower, it should be noticed that some of those most interested in the spread of popular education in India are not of this opinion, but believe that with a view to the education of the people generally, higher education, of a right kind, is what requires most to be attended to at present. Also the lower classes attached importance to what they saw those above them doing, and if they did not find that persons in high position valued education they were not induced to do so themselves. It was, perhaps, therefore wise both to promote education of a high class, and to encourage the higher classes of people to cultivate education with the view both of preparing those who should educate others and of stimulating those in the lower ranks of society to make efforts to educate themselves. No doubt the higher education was in a great measure sought by the people with the hope of getting Government employment, and this is surely the case in many places besides India. They knew what efforts were made in England with a view to obtaining Government employment, what a number of candidates appeared for every office in the civil and military services of the State. India did not at the present time offer such fields of honourable employment as were afforded by the liberal professions in this country. But in this matter things would advance no doubt in India as they had done in other countries, and learning would also come to be cultivated for its own sake. But they must not be disappointed that things had not gone on more rapidly. They must not be in too great a hurry, or expect that by merely wishing to expend larger sums of money, or by great effort on the part of the governing power, they could at once produce a certain amount of education corresponding to the expenditure bestowed upon it.

These and all other matters relating to education in India were now being examined most carefully by the Commission presided over by Dr. Hunter. We may well wait for the report of that Commission, and all hoped the result would be great practical gain to the education of the people of India.

The PRESIDENT said it was now his duty to move a vote of thanks to Mr. Johnston for the paper which he had read. In doing so, he might say they were as a Society not only indebted to Mr. Johnston, but also to their Indian friends who had addressed them, for the great amount of information they had given upon a subject which was very interesting in itself, but which comparatively few people in this country were able to give their attention to. The complaint was often made that people in England did not give the attention they ought to do to the affairs of India; but naturally it was not easy for people in this country, with so many cares and interests of their own, to give that attention to the affairs of India, however important in themselves, which many Indian people thought ought to be given. It really was one of the essential difficulties of the government of India, by another country and another people, that that people was not able to give the attention which was really requisite, and therefore the duty was left to the experts who were specially charged with its performance. It was desirable of course that the interest of this country in Indian matters should spread and increase, and whilst there was perhaps no sufficient ground for the complaints which were made, that the interest here was too little, they must all be gratified at any sign of that interest increasing, and he hoped that their proceedings of that evening would contribute to some extent to help in the attainment of that result. Speaking as one who was not an expert, he was much impressed with the tremendous difficulty of these Indian problems. The substance of what they had heard appeared to be this, that while the Indian people had a native education of their own which was very general, and which they accepted as up to the standard of their own necessities, they who were the governing class, with superior desires and wants, thought that that education ought to be much better than it was. All that they were able to do in that respect, however, seemed merely to touch the very smallest margin of the people of India, for they had only succeeded, as far as primary education was concerned, in giving that primary education which they thought desirable to about 5 per cent. of the population. A good deal had been said about the great expenditure lavished upon the superior education in India, as compared with that upon the primary education, and Mr. Johnston as well as one or two other speakers, had emphasised that as apparently a great omission or defect in what the Government had done for the education of the people. They must however have been impressed with the argument, that the necessities of India were so great, that it could hardly be said that in any direction what the Government had done was too much. The defect was, that whilst it did not do too much in any of the directions in which it pretended to do something, yet it was unable to do what was really requisite in other

directions. And this brought them to the other great difficulty, namely, that when they had satisfied themselves that the education of India was very deficient and that it would be very desirable to do a great deal more, the practical question arose, how was the Government to do any more. They spent now about 400,000*l.* or 500,000*l.* in the education of the people, but the Government of India was so constituted financially, that it could not possibly find more than 400,000*l.* or 500,000*l.* except with enormous difficulty. The financial problem in India overshadowed every other, and they could not say that the Government could spend even if it wished much more than that sum of 400,000*l.* or 500,000*l.* Then also the question would arise, and they saw it with reference to many similar problems in this country, that it was not altogether a question of expenditure. The Government of India might have facilities for giving a certain amount of the higher education, and might not have the same facilities on account of the difficulties of organisation in extending primary education; it could not find the instruments and the means in sufficient number for extending that primary education. These were all wonderfully difficult problems which had been brought before them, and in which they ought to take some interest, but which after all could only be left to the experts who were charged with the government of India. They were questions upon which public opinion in this country could never exert any real influence, as far as he could judge; it must be the opinion of special classes and of experts which would have to be taken. While, therefore, they had to thank Mr. Johnston and other speakers for the information which they had given, it must be recognised that it could not lead to much practical result as far as the direct government of India was concerned. The classes which Mr. Johnston must hope to influence were not the people of the United Kingdom as a whole, but that very small and special class which was charged with the government of India. In this way the paper would be very useful, and he had great pleasure in proposing a vote of thanks to Mr. Johnston.

Rev. J. JOHNSTON in responding, said he quite agreed with the two previous speakers who said that this was not a subject which could be settled in this country, and his only object in bringing it forward was to get a few intelligent persons to take up the question, in order that if it became a public question here, they might use their influence in the direction of helping forward what he regarded as a very important movement for the future welfare of India—the education of the people. He was also quite ready to admit that the voting of money would not of itself and at once lead to a great extension of elementary education. Even if the Government of India were able to devote an additional million to the elementary education of the masses, it would be some time before it could be advantageously applied. He was glad to say that a great step had been taken in the way of encouraging the indigenous schools, which, however imperfect, still formed a most important basis for elevating native education to a higher platform. Mr. Kirkham had referred to the large sum spent in Bombay in primary instruction, and disputed the accuracy of his (Mr. Johnston's) statement. He did not

distinguish between the sum spent on elementary education and the sum devoted to that object from the imperial grant. He could only say that the proportion of about 300,000*l.* on the higher to 100,000*l.* on the lower education was a statement printed by him five years ago, and although his pamphlet in which that statement appeared had called forth about a dozen replies in India and in this country, not a single critic upon that pamphlet who professed to know the facts had ever ventured to call in question that or any single statement that it contained. The 100,000*l.* given by Government for primary education, called forth from all parts of India by way of cess and municipal grants, voluntary contributions, fees, and other sources, 400,000*l.* more for the same object, so that there was, as he had stated in his paper, upwards of 500,000*l.* spent upon primary education, but only little more than 100,000*l.* of that came from the Government grant. With regard to the imperfect and ridiculous answers given in the examinations in colleges, he knew the same thing could be said of examinations in Oxford and Cambridge, but he called attention to the fact that out of 2,500 who were examined, there were actually 1,100 whose answers were so imperfect that they could not assign them a single unit of numerical value, and in the higher department still, of those who were going in for degrees, out of 700 who were examined there were only 128 whose answers were sufficient to allow of their being passed. As to the "abolition of colleges," it was a form of expression which entirely misrepresented his meaning. He had in a pamphlet written long ago advocated the "abolition or transference" of *Government Colleges* on the principles laid down in the despatch of 1854, but recommended it in the most cautious terms possible; so much so, that he said again and again, he did not believe there were more than three Government Colleges in all India that could at that moment be so transferred. It could only be done by the most gradual means, for he would not transfer a single college until the natives themselves were able to take up and carry on the higher education under their own management and with their own funds liberally aided by a Government grant. Mr. Kirkham seemed to be replying to that old controversial pamphlet, and not to the paper which has been read to-night. In preparing that paper, he, Mr. Johnston, had guarded himself from the charge of controversy. He had scarcely spoken of the abolition or transference of Government colleges; the terms chiefly occurred in quotations, for the most part, from official Government documents. If the simple statement of facts, to which he had almost exclusively confined himself, as the character of the Society required, had left on any one's mind the impression that he was arguing for the transference of Government colleges to local management, it was not his fault. The facts must be held responsible. The parallel drawn by Mr. Kirkham between the middle classes in England and the poor Brahminical castes in India, who are now taking the place of the old ruling class, is so obviously inconsistent with facts, as to need no remark; no two classes of men on earth are so diverse in mental, moral, and physical characteristics.

POPULAR EDUCATION *in ENGLAND and WALES before and after the*
ELEMENTARY EDUCATION ACT of 1870.

By ROWLAND HAMILTON.

[Read before the Statistical Society, 22nd May, 1883. The PRESIDENT in the Chair.]

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1. It had been my first intention to entitle this paper "Twelve 'Years' Work since 1870 under the Elementary Education Acts;" but to describe this truthfully and intelligibly, and with that degree of accuracy which should characterise the papers of this Society, it was necessary to give some definition of the terms used when discussing the subject. Much error and confusion has arisen from speaking of schools as "good," "bad," or "efficient;" of "passes," of "attendances," and so on, without having some clear notion of what these terms imply, the more so as they always have been, and are still, used with reference to changing standards which are, and for the most part ought to be, continually advancing and subjected to more efficient tests. So essentially has this work been one of laborious growth, that I found on grappling with the inquiry that I could completely do this only by some notice of the origin and development of the agencies employed, still taking the year 1870

as my standpoint. This course will better enable us to understand the anomalies of the Act, which was indeed a turning point in the history of National Education, but was not, nor ever was intended to be, final or theoretically perfect. Further, when we speak of work done, the weight of opposition which had to be overcome must not be forgotten. The test of results without this qualification may be very flattering, but is altogether delusive. Many things difficult of attainment in one generation, become mere matters of routine in the next, and the danger is ever recurring that life may die out of this routine. Words and figures may, over and over again, imperceptibly come to record those good intentions which proverbially pave the downward road. "Qualitative," as well as "quantitative," analysis has to be applied at every stage of investigation into the complex history of such social development.

Over and over again we shall find remedies of the most inadequate description regarded with the utmost complacency, and even now that the century is far advanced, the primary obligation of imparting the very first rudiments of learning to the population at large, is far from being fully accomplished.

2. Many of the agencies at work in 1870 have their origin far back in our history. The seventeenth century has been described as a period of Grammar Schools, and the eighteenth as one of Parochial "Charity" Schools; but the doubtful reputation of the latter for pretentious inefficiency attaches rather to those foundations where board and lodging, clothing, or other eleemosynary advantages were given with an education studiously adapted to keep down the recipients to that station of life which the donors thought fit for them. Still, the general attitude of rigorous repression towards the "lower orders" belongs to a broader question of social condition. We start from times before Romilly and those who followed him, had brought about the amelioration of our most sanguinary penal code.

Nevertheless, though the smaller endowed schools were not pretensions, they were in no way distinguished on the score of efficiency from the larger number of private and dames' schools scattered irregularly over the country. But the ordinary grammar and other more largely endowed schools were, as a rule, even less adequate to supply the wants of the "intermediate" class for whom they were ostensibly provided.

So in the early part of the century there were two distinct evils against which the advocates of popular education in England had to make head—(1) the want of a sufficient number of schools, and (2) the want of any appropriately adequate standard of attainments within the reach of popular apprehension.

These evils were combated by private exertions—by legislation directed to the better use of existing endowments, and to the regulation of children in factories and workshops, securing *inter alia* some attendance at such schools as were available for their instruction; by the system of State grants in aid of private exertions; and lastly, by the Acts of 1870 and 1876, which imposed on local authorities the duty of making good the deficiency of public elementary schools throughout the country. There is much difficulty in presenting these diverse agencies in a consecutive narrative. To take merely the dates of reports and debates, would be to ignore the actual conditions under which much of the earlier work of education was carried on, for the dense ignorance on the subject which generally prevailed was very slowly dispelled. I have therefore endeavoured to show first the course of the partial legislative and other subsidiary efforts made, and then to take up the account of the education department, which was destined to become the centre towards which all the most valid work has ultimately gravitated.

3. The first efforts were directed to supply the former deficiency. Joseph Lancaster had begun teaching before the end of the century, and met with considerable support; and when he fell into pecuniary difficulties the Royal Lancastrian Institution was founded in 1808. This, in 1814, merged in the *British and Foreign School Society* “for promoting the education of the labouring and manufacturing “classes of society of every religious persuasion.” Dr. Andrew Bell meantime had published an account of a system which he had practised in Madras, and in a pamphlet published in 1803, Lancaster frankly acknowledges his obligation to him for useful hints. Both worked on “the mutual” system, that is, the employment of children to control and instruct children. Dr. Bell, however, made no mark as a teacher until taken up by the National School Society, formed in 1811 to counteract what was regarded as the undue influence of the Lancastrian Society. The former was supported by a section only of the clergy of the Church of England, associated with many Nonconformists. Politically it received the sympathy of the Whig party and of the “Edinburgh Review,” and had no fears as to carrying education “too far.” The National School Society for promoting the education of the poor in the principles of the Established Church, was far more strictly a Church of England association, and commanded the influence of that wealthy body. It was incorporated by Royal Charter in 1817. Even those who would rather have had no education for the people at all, felt that the less of two evils was to keep the schools under their own control. Bell and his supporters had their fears about writing and arithmetic as tending to raise

above their station those who were doomed to labour. Nevertheless, the movement was distinctly one of advance.

Raikes also, the first founder of Sunday schools in 1784, should find a place in this notice. Though now happily no longer required to impart secular instruction, these institutions were the means in the early part of the century of conveying the first rudiments of knowledge to many in their day, and first broke the ground in many an uncultured region. The Sunday School Union was founded in 1803.

The names of the two former appear as recipients of the first aid granted to education by the State in 1833.

4. A notice of factory legislation may most conveniently be given here. Acts containing educational clauses, sometimes of a stringent nature, were passed, affecting special industries, while broader attempts at a more general system of primary schools were time after time defeated. An Act of 1802 (42 Geo. III, cap. 73, sec. 6) required that all apprentices during the first *four* years of their service should be instructed "in some part of every working day and in the *usual hours of work*, in reading, writing, or arithmetic, or either of them, according to the age and ability of such apprentice, by some discreet and proper person to be *provided and paid for by the master*, in some room or place to be set apart for that purpose; and this time is to be deemed and taken on all occasions as part of the respective periods limited by this Act during which an apprentice shall be employed." This and other provisions, however, must be taken as merely declaratory, for the next Act, in 1833 (4 Wm. IV, cap. 103) admits no proper officers had been appointed whose special business it was to enforce the regulations which had been made. Four inspectors (with an undetermined staff of sub-inspectors) were vested with extensive powers to make "rules, regulations, and orders," and to establish, or cause to be established, such schools as might be required, and permission to work was only given to children over nine, on production of a certificate of school attendance for two hours a day for six days of the week preceding, and other provisions of a similar tendency were laid down. Still the legislation was on a wrong tack, and the practical experience which is expressed in the Act of 1844 (7 and 8 Vict., cap. 15) is very instructive. All the extraordinary authority to make rules and lay down the law generally were withdrawn, but effectual powers of investigation were given to the inspectors. On these lines much most useful work has been achieved. Neither the inspector nor the inspected can raise the question whether the law of the land is or is not to be obeyed, and the strict letter of official duty requires simply that its representative should "inspect and report." The operation of these Acts was

gradually extended to trades and industries not at first included in their provisions, the way for further legislation being carefully prepared by the personal influence of the inspectors working under direction of the Home Office, and always ready to co-operate with employers of labour in efforts to solve the problem of satisfying the exigencies of special industries, with due regard to the permanent welfare of the employed. Many difficulties and "impossibilities," especially concerning the education of children, disappeared under the patient persistence with which those broad principles were inculcated. A long series of partial and tentative Acts will be found scheduled in the Consolidating Act of 1878 (41 Vict., cap. 16), though now things of the past. The perusal of them would not be without interest to the student of the development of social morality. There are no materials out of which any statistical record could be constructed which would throw any further light upon the advantages thus gained. In many cases the schools first formed were lamentably weak, in some cases even the existence of such schools delayed the establishment of those formed under the higher standard of the Elementary Education Act of 1870, though there is no room to doubt that the numbers taken up by the latter were largely increased by the habit of school attendance which had thus been created. Special factory schools may now be considered as merged in the general system of primary schools. The question of "*half time*" attendance is however still one of special interest to these industries, and will be referred to hereafter.

5. The abortive attempts to establish such a general system is the most instructive chapter in the history. These I shall now proceed to summarise as concisely as possible, and even the vague and imperfect numerical estimates first formed, afford a most significant indication of the conditions with which successive statesmen have had to deal. Mr. Whitbread brought in a Bill in 1897, "for establishing Parochial Schools in England and Wales for the instruction " of the children of the poor," prefaced by a statement, that out of a population of 8,370,000 in England and Wales, 1,234,000 were in receipt of parish relief. It was printed as amended on 17th April of that year, and sought to ordain that within one year "a sufficient " number of schools " should " be established and for ever there- " after continued." The ministers, churchwardens, and overseers of every parish were to lay before the inhabitants, in vestry assembled, a statement of what buildings could be hired or purchased for the purpose required. The vestry was to make a presentment to the justices of the peace in special session, who could approve or disapprove of the proposals submitted, and if these were unsuitable or inadequate, might *order* the churchwardens and overseers to hire, purchase, or erect the buildings

required, but might not authorise a larger levy than 1s. in the pound unless the inhabitants consented thereto. A similar course was to be followed for the appointment, payment, and control of suitable teachers, and for the general maintenance and regulation of the schools established. The children were to learn reading, writing, and arithmetic, and the girls plain needlework, knitting, &c.; their attendance, however, was not to be made compulsory. The children of parents "not having, or being able to obtain by "due diligence more than the ordinary price of labour in the "parish" (whether in town or country) were to be taught free of expense for two years between the ages of 7 and 14. Orphans and deserted children, or those wholly or in part supported by the parish were to have the same privilege. Others to pay according to regulations laid down by the authorities above referred to. An ultimate appeal lay to the justices in quarter sessions. This Bill, however, appears again, printed as ordered on 21st July following, so amended as to be entirely permissive and inoperative, but was eventually thrown out in the House of Lords in August. The original Bill has not been preserved in the library of the Home Office or in that of the House of Commons, but as first amended it evidently preserves the pith of the legislation intended.

6. The provisions of this Bill are so incongruous with any apparent means for carrying them into effect, that one is almost inclined to suppose that they were the invention of some didactically-disposed angel who had wandered altogether out of his own sphere. But the preamble gives a clue to the source from which they were derived; and in the introductory speeches, the testimony of Fletcher of Saltoun, a well-accredited authority at the time, was cited, to the effect that at the end of the seventeenth century Scotland was infested with a lawless population of hardy and utterly lawless beggars and vagabonds to the number of one or two hundred thousand, the population at the time being probably about a million and a half. The effects of an Act finally passed in 1696 had, in the course of the following century, effectually abated this evil. The genesis of this Act is worthy of record, for its influence can be traced in all subsequent legislation in Great Britain. John Knox, at the time of the Reformation, fought stoutly to secure a provision for education out of the revenues of the Church, and the Second Book of Discipline (A.D. 1578) of the Presbyterian Kirk laid claim to an appropriation of funds for the maintenance of schools. That this was denied to it is not to be regretted, for it left open the way to establish an efficient school system on a broader basis. After a declaration of Privy Council in 1616, and an Act of Council ratified by Parliament (1633, cap. 5), both rather of a hortatory and "permissive" character,

the Act of 1646, cap. 46, did "statute and ordain that schools and "schoolmasters should be provided in every parish on advice of "the presbyteries." This was rescinded at the Restoration, but substantially re-enacted in 1696 (cap. 26). On failure of the heritors to found and maintain the schools required, the presbytery might apply to the "Commissioners of Supply," who could carry out the work as effectually as the heritors who had neglected their duty, but who, of course had to bear the charges. An appeal, however, lay to the Lords of Session. The executive powers were, in fact, similar to those first given in England by the Elementary Education Act of 1870 (sections 63 to 66), in the case of School Boards in default. The teachers' salaries were fixed at 100 and 200 marks (the mark = 1s. 1 $\frac{1}{3}$ d.). The remuneration was raised to 300 to 400 marks in 1803 (Geo. III, cap. 54), with a two-roomed house with a quarter of acre of garden, or compensation in lieu of it. These and similar Acts evidently meant work in earnest, and secured it. But in Scotland sound traditions of national education had never died out. Mr. Alexander Dunlop's "Parochial Law" (Edinburgh, 1841), from which I have drawn many of these particulars, quotes some quaint minutes from places in Fife. One from Anstruther, in A.D. 1600, requires that "the "pure of the tune be put to schule," and "so many of them as "have ingyne and he (the master) takes paines upon them shall "give fyv sh: in the quarter, which the Session shall pay." And goes on, "and as for uther yt are not able to perfit yt they may "reid or wret whether it be for want of ingyne or tym to await on "sich shall be caused to learn" sufficient to enable them to pass the examination for the Communion of the Kirk, "quhilk travail "also the Session will acknowledge and recompense." This is not quite so drastic as "Robert Lowe's Code" in 1862, but shows that careful thought was given even to those who could never become scholars. The county of Fife was, perhaps, specially favoured as coming under the influence of the University of St. Andrew's; but as regards the higher education there was a keen rivalry between the old Church and the new. University extension dates from times before the Reformation, though no doubt stimulated by causes which led to that movement. Our king, who "never said a "foolish thing and never did a wise one," may be an early example of the evil results of premature *cramming*. The Acts of the Assembly show a constant assiduity in all that concerns popular education, while poor children who had mastered the rudiments were freely admitted into the grammar schools.

The editor of the "Annual Register" for the year 1807, adds a long note in the key of *non possumus* to his report on these proceedings, pointing out the difference between the condition of England

and that of Scotland. But this difference was chiefly the result of an adequate remedial system steadfastly pursued for more than a century. The discussion, however, diffused much useful knowledge of the subject, for by order of the House the original Bill was printed and circulated to all justices in quarter and petty sessions.

7. The third and last report of Mr. H. Brougham's Select Committee "on the Education of the Lower Orders" was printed on 3rd June, 1818. It urged that if assistance were given to provide school houses, the charge of maintaining them could and would be provided by voluntary exertions; and this we find developed in the principle of making "building grants" when State aid was first afforded fifteen years afterwards. It stated that a teacher's salary should not exceed 24*l.*, with fees from those who could afford to pay them. It refers to, but does not grapple with, the "religious difficulty." Finally it bears testimony that "the anxiety of the poor for education continues not only unabated, but daily increasing;" that this feeling "extends to every part of the country," and is equally "prevalent in those smaller towns and country districts where no means of gratifying it are provided."

8. Following on these reports he formally attacked the subject again in 1820 in a great speech, introducing a very elaborately prepared Bill. It proposed that (1) the grand jury assembled at quarter sessions, or (2) any two justices of the peace, or (3) the rector or minister of the parish, or (4) any five householders should be empowered to bring a complaint before the justices in general quarter sessions in case there was no school, or only an insufficient school in their parish; or the grand jury might, if they thought fit, adopt the complaint of any one householder.

The justices were "to try and examine the matter" at the same sessions, and might advance any sum required to the officiating minister or churchwardens, 200*l.* of which was to be repaid from the consolidated fund, but the rest was to be borne by the county rates. Other conditions were included as to obtaining sites, &c., &c., which are now of no special interest. The teacher was to be chosen by a meeting of school ratepayers, the churchwarden presiding, and the officiating minister having an absolute power of veto, but he could not approve unless satisfied that the candidate was a member of the Church of England as by law established. Ministers, however, were not themselves to be eligible as teachers. Fees were to range from 4*d.* to 1*d.* per week, with a power of total remission with the consent of the churchwarden. The Church catechism was to be taught, but on the other hand this conscience clause was to be imposed: "That if any parent, or guardian, or other person having the care of any scholar attending such

“ school shall notify to the master thereof, that he or she desires
 “ such scholar may not attend on the days and at the hours when
 “ such catechism or portions of liturgy are taught as aforesaid,
 “ such scholar shall not in any manner of way be obliged to attend
 “ at such days and hours, nor punished, or otherwise chastised, or
 “ molested for not attending.”

His speech (“ Hansard,” 20th June) dealt largely with figures, with which he was amply supplied by the clergy generally, to whom he had referred, and to whom he signifies his obligations for the readiness with which they had responded to his appeal. He took the number of children capable of receiving education at one-tenth (rather than one-ninth as some had contended) of the whole population, and further argued that only a moiety were in a position to require aid, for he “ did not suppose that every other man was a “ pauper.” This argument was directed against a statement by Mr. Colquhoun that 1,750,000 children grew up in ignorance.

The population of England and Wales I may state was 10½ millions by the census of 1811, and a little over 12 millions by that of 1821. Brougham’s returns gave the result that—

490,000	children were in unendowed schools,
165,432	„ endowed schools,
11,000	„ added for 150 parishes from which he had received no return.
<hr/>	
660,000	total.

Showing one-fourteenth to one-fifteenth only in the way of receiving education. Making a deduction of 53,000 for dames’ schools “ in which nothing was learnt,” he reduced the proportion to one-sixteenth. He stated further that since 1803 schools to the number of 1,520 had been established on the systems of Drs. Bell and Lancaster, providing for 200,000. Before that addition the proportion was 1 in 21 only. Also that of 12,000 parishes and chapelries :—

3,000	were supplied by endowed schools,
3,500	„ unendowed schools,
3,500	had no school even in name.

It is difficult to compare figures so rendered with statistics in the form with which we are now familiar. The total number of scholars in schools for all classes of society was taken. A “ tenth “ of the population ” would represent children during a range of rather less than four and a half years of their lives, but there is no indication of what was then considered to be the school age. However, some further particulars given serve at all events to show the “ best opinions ” on statistical matters, which could not

then be based on any very accurate data. In *Middlesex*, school accommodation is stated as existing for 1 in 24, or excluding dames' schools 1 in 46. For *Lancashire*, *Somersetshire*, and *Wilts*, 1 in 24; in the six *Midland* Counties the same proportion.

In East Anglia. Proportion 1 in 21	....	30,000 children free.	24,000 paid.
Four Northern Counties	.... 1 in 10	16,300	„ 37,000 „
In Westmoreland	..... 1 in 7	48	„ 2,652 „
Wilts and Somerset only. See above	....	16,000	„ 11,000 „

the term “free” generally indicating endowed parochial or charity schools, while a considerable proportion of those who “paid” would go to what we would now term private adventure schools.

These figures will give a rough indication of the schools existing, but throw little light upon their quality or on the actual attendance in them. This Bill never got beyond its first reading, on 11th July. The compromise suggested for the Church, Dissenters, and Roman Catholics was rejected on all sides, and behind this was a dead weight of apathy and opposition on social and political grounds.

9. Two years before, in 1818, Mr. Brougham had requested that a Committee of the House of Commons, formed early in that year to consider his Bill respecting the education of the poor, should be deferred to give time for the inquiry into the application of charitable funds. In the previous century a stringent Act had been passed against the abuse of such funds (“Gilbert’s Act,” 26 Geo. III, cap. 58); but the complaint was urged that the returns made under it were not faithfully or adequately given, and that strict local investigation was urgently required. He stated (see “Annual Register,” 18th May, 1818) that a knowledge of the movement for inquiry had brought out many disclosures from places where no abuses had been suspected. Lord Kenyon had denied that the Statute of Charitable Uses afforded any remedy, for “the grossest abuses being everywhere notorious,” it had been “resorted to only thrice for above half a century,” and the last time with results most disastrous to those who had sought to obtain justice. It is needless to go further into this question, but I wish to show for how long a time it has been keenly debated, and one cannot help feeling that while “the law” had a great sympathy with anyone holding a sinecure place, it had no regard for “a public” which could not appear in a corporate capacity, and show a fund at its command out of which costs could be paid. Ground was gained, however, for though the action of the Court of Chancery could not be made effective, the Commission of Enquiry into Charities, first appointed on 20th August, 1818, was

continued by repeated Acts till 1837.* Its investigations embraced all endowed schools, and some impatience was expressed in the House of Commons at the fragmentary way in which the annual returns were made. Considering the "passive resistance" with which the Commissioners would be met in many cases, this may well have been unavoidable.

A digest of the annual reports, printed 20th January, 1832, reported very minutely on twenty-two counties, including York; but their last report in 1837 leaves on record the want of a general index to a vast mass of information collected, which does not seem to have been satisfied till 1843. The cost of the Commission regularly appears among the votes of supply, but it carried on its work silently.

These very full and elaborate reports afforded a basis on which the later Schools Enquiry Commission of 1864 could effectually work.

The total number of charities was found to be no less than 28,854, with an alleged income of 1,209,395*l.* of which 312,000*l.* were specifically appropriated to education, but for the most part in very small sums, and these funds were much wasted by carelessness and litigation, viz.:—

£		£		£	
13,331	under 5	|	43	from 2,000	to 9,000
4,641	„ 10		6	„ 10,000	„ 25,000

The larger endowments were, as might be expected, chiefly devoted to the higher education; but to this subject fuller reference will be made hereafter.

Something, however, seems to have been done meantime to check "an error which is very prevalent, but, as it appears to us" (final Report, 30th July, 1837), "unsupported by any authority, "and contrary to the tenor of the decisions of the Court of Equity, "that charities given to the poor in general terms, or for the relief "and support of the poor, are applicable in aid of parish rates." In some cases, where the funds were large, the directions of a court of equity were obtained through the Attorney-General; but the greater number of charities were too small for that remedy. It is evident that the principal of many such funds had been irretrievably lost to the public.

* The Act first establishing this Commission is 58 Geo. III, cap. 91 (1818). Act 59 Geo. III, cap. 81 (1819), somewhat extended its scope, and is to be construed with it. Act 59 Geo. III, cap. 91 (same year), gave some further powers for investigation. Subsequent Acts extended the time required for the inquiry. The Oxford and Cambridge Colleges; Westminster, Eton, Winchester, Charterhouse, Harrow, Rugby, cathedral, and collegiate institutions; all those for whom special visitors were provided by their trust deeds, and those for Jews, Quakers, and Roman Catholics, were specifically exempted.

10. Up to 1832 several Acts were passed for promoting the building of churches and the residence of parochial clergy, but little or nothing was done in parliament directly bearing on any scheme for national education. But in that year 20,000*l.* was voted exclusively for grants in aid of building schools, and was dispensed by the Treasury on applications made through the National and the British and Foreign School Societies. This grant was repeated annually up to 1839.

Henceforward the progress of popular education may be most clearly followed with reference to the administration of grants-in-aid through the Committee of the Privy Council, which has gradually gathered round it the main strength of this national movement. But before entering upon this course, it will be convenient to glance very briefly at further efforts at legislation, and some strong currents of opinion regarding them, which modified or restricted the action of parliament and of the Government in this respect.

11. Lord Brongham, now in the House of Lords, brought forward ("Hansard," 21st May, 1835) a series of resolutions deprecating the opposition of those who might think more of his political character and habits than of the merits of his scheme, or be moved more "by the wrongs of persons than by the rights of things." He estimated the number of unendowed schools at 31,000, with 1,144,000 scholars, basing his calculation on returns taken from thirty-three counties, including Lancashire and Middlesex; but states that the number in endowed schools had fallen off from 166,000 (see para. 7) to 150,000, "notwithstanding the introduction of the Bell and Lancaster "system into many of them." The total of 1,294,000 gives about 1 in 11 on the whole population, but this includes 65,000 infants, and he refers to "a school age of 7 to 11 or 12 years," so that the number is still inadequate. He describes the teaching given as reading, some writing, and very little arithmetic, and considers learning of this kind only another name for ignorance. His panegyric on infant schools, though not very discriminating as to the nature of the faculties which can be called forth in a child under 6 years old, enforces the great truth that it is "through neglect that "they grow up into the stupid boys and dull men that we see." He advocates normal seminaries for 500 teachers, and proposes a general Bill for parish schools at the public expense and under public supervision, and sundry regulations for the better administration of charitable trusts. The subject, after some expressions of interest, was adjourned till 30th June, when the specific resolutions were withdrawn, on the general assurance of Lord Melbourne that his Government had the cause of education very much at heart.

A committee appointed by the House of Commons in March, 1835, though making a very short report, submitted some interest-

ing evidence on various branches of the subject. The general tone of all classes of society had greatly improved. The strong prejudices which had existed against the education of the industrial classes were much mitigated. One remark (A. 939, Mr. F. Place), that "working people are no longer mixed indiscriminately with the dissolute as they were in former times," probably conveys a very just idea of the nature of the benefit secured; imperfect and incomplete as the system was, the more able and energetic often could and did find means of getting the instruction which aided them so much to better their position. This witness lays much stress however on the humanising consequences of the relaxation since 1824 of the combination laws. From many sources also we learn that the rise in wages was very general, except for wholly unskilled labour, or where there was an over supply of specially trained labour in particular industries. The necessity of training and educating teachers is very clearly expressed by the most discriminating witnesses, and the advantage of organised infant schools is recognised. The rapidity with which large numbers of children passed through some of the more popular schools, forbids the conclusion that upon the average very much knowledge was acquired. The great want of lower middle class education, such as should be carried on till the age of 14 or 15 years, forces itself into consideration. One witness, Mr. J. Simpson of Edinburgh, expounds a complete system of education, with which the names of Combe, Pillans, and Chambers are associated. The excellent work of the Manchester Statistical Society shows the practical spirit in which the subject had been taken up in that quarter.

The subject was also brought forward very forcibly in both Houses in 1837-38, supported by statistics of a similar character to those cited in 1835, but Lord Brougham complained that there was no assurance of work actually done. He advocated the appointment of three stipendiary commissioners, specially charged with the supervision of the educational interests of the country; also an educational voting qualification, partly in connection with mechanics' institutes, of which he had constantly been a zealous promoter.

12. In 1842, Lord Ashley got leave to bring in a Bill for the regulation of factories, and in 1843 moved an address to inquire into the best means of diffusing moral and religious education among the working classes, estimating the deficiency in school attendance at over a million, and drawing a strong picture of the depravity in Birmingham, Manchester, and other large towns, which had a great effect upon the House. A Bill was actually introduced by Sir Robert Peel, then Premier, and Sir James Graham, embracing this subject, and comprising also a very general scheme for

education under the charge of the Established Church; though a strong declaration "conscience clause" was contained in it. The proposal naturally caused great alarm and suspicion among a large body of dissenters. No terms could be found however on which Churchmen and Nonconformists could agree, and many of the latter became for a long period the irreconcilable enemies of the system of State aided schools. All attempts to carry out its general provisions were abandoned as hopeless. Only some of those more specially relating to factories were included in the Factory Act of 1844.

In 1850 Mr. W. J. Fox (with Mr. Henry and Mr. Osborne) brought in a Bill to promote "the *secular* education of the people of "England and Wales." It started with a very practical suggestion, that the inspector under the Committee of Privy Council on Education should make periodical reports on the state of secular education in each parish: all private schools submitting to secular inspection, and all schools of the Established Church, or any other religious body, were to be included in estimating the means for supplying educational wants. Deficiencies were to be supplied through the agency of local educational committees, under supervision of the Committee of Council, who might direct a payment of not more than 10s. per child, on the inspector's report that the pupil had received sufficient secular education. The schools were to be free and chargeable on the rates; special time was to be set apart for religious instruction, according to the *will of the parents*. High rates of pay were proposed for teachers, and the same instruction was to be given to all scholars alike. This Bill was thrown out by 287 against 53 on the second reading.

In 1853 Lord John Russell, apparently on a formal motion, brought the subject of popular education generally at length before the House of Commons, and in 1856 proposed a series of resolutions with the object of revising and consolidating the minutes of the Committee of Council, extending its staff, and requiring reports regarding the available means for the education of the poor in each district; enlarging the powers of the Commissioners of Charitable Trusts, and empowering Justices in Quarter Sessions to levy a school rate where any school district should be found deficient. These and some other resolutions less open to controversy and designed to "make the education of the country more complete, and maintain "and encourage what was good in the present system," were lost in a Committee of the whole House by 158 against 102.

Early in 1857 a Bill bearing the names of Sir John Pakington, Lord Stanley, Mr. Cobden, and Mr. Headlam, was introduced, attempting to deal only with *corporate* cities and *boroughs*; but this also never got beyond the second reading: apathy, the reluctance

to incur expense, and the "religious difficulty," combining to work out its defeat.

In 1867 Lord John Russell again brought forward a series of resolutions on the importance of the education of the working classes. One-sixth of the population now appears as the number which should be at school. The middle classes, it is urged, should be aided by a better administration of endowments; local rates should be resorted to more largely, and a minister of education should be appointed. These and other minor points called forth little discussion, and the subject dropped.

In 1868 Mr. H. A. Bruce brought in a Bill still more closely foreshadowing the Act of 1870, while Lord Marlborough on behalf of the Government (Mr. D'Israeli's) brought in another. The latter minimised the existing deficiencies, deprecated rating as likely to relax voluntary effort, and proposed several changes intended to extend the advantages of inspection, and the receipt of the State grant-in-aid. This Bill was abandoned "in consequence of the "state of business," and the former also was withdrawn. But the general tone of the debates show a marked advance in the desire on all sides to provide, not merely nominal, but practical and adequate means for popular education.

13. One of the immediate results of the abortive effort to solve the religious difficulty in 1843, was the formation of two more distinctive societies: the Voluntary School Society, chiefly in connection with the Baptist congregation, did some service for awhile, but did not long survive; the Congregational Board of Education was founded in 1843, and appeared in 1850 supported by Mr. Bright as petitioning against any grants of public money as dispensed by the Committee of Council for Education. Both these bodies drew some members from the British and Foreign School Society; but the funds of that institution continued to increase, and greater activity in the work of founding schools was the result of the augmented agency, though there is too much reason to fear that the true interests of education, religion or morality, became very secondary considerations in the heat of the rivalry established. It was not till 1867, that Mr. Baines in his address to the Congregational Union at Manchester, announced a complete change in his own opinions, and in those of a large portion of that body throughout the country, as to the scruples which had prevented them from accepting State aid for their schools.*

The further institutions formed were the Home and Colonial School Society in 1836; the Wesleyan Committee in 1840; the London Ragged School Union in 1844; the Catholic Poor School

* Sir J. K. Shuttleworth: "Memorandum on Popular Education," 1868.

Committee in 1847, and the Church Education Society in 1853. The aid of the State was open to all alike who fulfilled the prescribed conditions of efficiency, but all were not equally willing to accept it or able to contribute their quota.

14. *The vote on the annual grant* always afforded an occasion for discussion or explanation, which was not however very frequently used. The debate on the minutes of 1846 will be better explained in its place when giving the account of the progress of the Committee of Council on Education. A great, though gradual change in opinion during the generation under review, may be here noticed. So strong was the feeling in 1838 against any "interference" of the State with matters of religion or education, that Mr. Hadley took objection to a vote of 4,500*l.* for the relief of poor refugee ministers, and proposed that 1,905*l.*, which was the share of dissenting ministers, should be omitted, on the ground that it was opposed to the fundamental principle of voluntarism. He was supported by Mr. Joseph Hume, and also by Mr. Baines on the matter of principle. The movement had no effect, and probably was not intended to deprive the recipients of a bounty which had originally been made by a Royal grant, but it serves to show the intensity of existing feeling on the subject. Mr. Baines, Mr. Hadfield, Mr. Miall, Mr. Alexander, Mr. Morley, are a few out of many who were strong advocates of the voluntary principle, who entertained the strongest and most persevering faith in its efficiency; Sir Robert Peel, Sir James Graham, Mr. Cobden, and many others were also very much inclined to it. As a sign of the times it may be told how the first named statesman was attacked in the House in 1841, on the ground of the support he had given to some educational and scientific institutions at Tamworth. He was charged with having betrayed a utilitarian spirit, and with trusting to such means rather than to religious training for the improvement of the working classes. His defence of rational amusement as promoting not merely morality, but also religion itself, by rescuing the people from debasing habits, and the advantage of showing them that science was not merely for the rich, was received with "marked applause;" which however can hardly be taken as indicating more than the turn of a strong tide.

Two distinct lines of opposition are here indicated; from those who practically acted upon the maxim that, for the poor at all events, ignorance was the mother of devotion, and of all the virtues that were befitting their condition in life—and from those who with high and even exaggerated views as to the elevating tendency of learning, still considered that the help of Government on any terms was but a baleful form of tyranny in disguise, and altogether uncalled for by the exigencies of a case with which they felt them-

selves fully competent to deal. They had to learn practical wisdom, and the necessity of organisation to secure great and enduring effects, by the lessons of a long experience.

15. Although these repeated debates did not lead to any general legislative action on the part of Parliament, the powerful appeals to it as the supreme deliberative council of the nation were not without their effect in influencing and informing public opinion, and supporting administrative action which cannot well be understood without the reference to them.

Taking up again the thread of the subject from Sec. 10, we find 78,798*l.* expended in the four years 1834-37 in aid of 233,947*l.* contributed from private sources; by which means it was estimated that 153,000 children would be provided for in diminution of the existing deficiency; and the increased number of applications for assistance had compelled the Government in 1837 to increase the stringency of their rules. These grants were exclusively for school buildings. In 1839 a proposed grant of 10,000*l.* in aid of training or normal schools met with so much opposition (chiefly on religious differences), that the sum was divided between the National Society and British and Foreign School Society for aiding the erection of primary schools.

In 1839 also the administration of the funds voted was transferred from the Treasury to the *Committee of Privy Council on Education*, and the grant was fixed at 30,000*l.*, which was continued annually till 1841. 40,000*l.* yearly was voted for 1842-44. It was raised to 75,000*l.* in 1845; to 100,000*l.* in 1846-47, and to 125,000*l.* in 1848-50.

The minutes (which word I shall apply to the minutes of the committee just named) of 24th September, 1839, state that 307 applications had been made for schools for 58,302 children. For each 10*s.* of grant, at least *one* child was to be accommodated. The Government right of inspection was specially reserved. Only in special cases (M. 3rd December, 1839) was aid given to other than the two Societies named, but Church of England parish schools appear to have been early included. The inspection (see vol. of Minutes for 1839, p. 19) was designed to be a means of co-operation between Government and school managers. The inspectors were generally under the control of the Archbishops as regards church schools, and were not to interfere with instruction, management, or discipline, but to examine as to religious teaching whenever invited to do so. The "three R's," geography, English history, grammar, etymology, vocal music, linear drawing, and land surveying, are referred to as subjects to be taught. Grants to poor and populous places were sometimes made, but as a rule aid was given to supple-

ment private contributions, and to those only who could be held responsible for the maintenance of the schools so aided.

In 1843 grants (M. 22nd November) for houses for teachers of schools certified as efficient, and for apparatus, &c., were made, and also for a portion of the original cost of *building* training schools by the two Societies already referred to, which in 1844 (M. 16th January) was fixed at 5*ol.* for each pupil to be received.

Lord Ashley in his speech in this year (sec. 12) took *one-fifth* of the population (15,900,000) as comprising all children requiring education. From this fifth, or 3,181,000, one-third was deducted as presumably not requiring aid, leaving 2,121,000. Further deductions, including 10 per cent. for absences and casualties, reduced this to 1,859,000. He cited tables by the Rev. W. Burgess, showing schools of the Established Church for 750,000, and for 95,000 in schools of dissenting bodies, in all 845,000, leaving a deficiency of 1,014,000. A strong picture was drawn of the depravity of Manchester, Birmingham, and other large towns. Large towns especially have benefited by such exposures, yet still I cannot but think they might justly urge that the "surplus population" of rural districts came to them grievously unprepared either to resist the temptations or avail themselves of the advantages of these new organisations of industrial life. But many years had to pass before the full measure of the evils of ignorance either in town or country was faithfully recognised.

In the year 1846 some further important changes were taken: the staff of inspectors was increased (M. 25th August and December); exhibitions to normal schools for apprentices (or "pupil teachers") were granted; also subsidies to teachers who had studied at the training colleges, and this principle of encouragement to teachers to qualify themselves for their profession became a leading feature in the policy of the Committee of Council till 1862. It was also proposed to afford substantial aid to day schools of industry, to school field gardens, to workshops for trades, and to school kitchens and washhouses, in the shape of grants for rent, buildings, tools, and appliances, and special gratuities to teachers. In the debate in April, 1847, it was urged that upon the question of a vote of 100,000*l.*, contingent expenses, which might run to ten or twenty times the amount, were proposed. The safeguard alleged was that private contributors would be required to find the greater portion of the outlay. The vote for 100,000*l.* was only passed, but these latter schemes were carried out partially in pauper and other schools under the immediate control of the State. Mr. Bright declared that no conscientious Dissenter had yet availed himself of the grant, combating T. B. Macaulay's dictum that it was the duty of the State to educate the people. Sir Robert Peel considered

that the voluntary system had failed. On the whole, the debate indicates decided progress in opinions, the chief defect being the almost ludicrous under-estimate of the means required to give practical effect to the large undertakings suggested.

16. I may here notice the first attempt at complete enumeration of schools made at the time of taking the census in 1851. The returns, however, were voluntary, and the explanatory notes at the end of Mr. Horace Mann's "Special Report on Education in England and Wales," show some of the difficulties against which he had to contend. I have space only for some very brief notices, chiefly of statistics which are partly retrospective. Combining returns (pp. xvii and xx), we have:—

Year.	Total Population.	Schools.	Scholars, all Ages.	Proportion of Scholars to Population.
1818	11,643,000	19,230	675,000	1 in 17·25
'33	14,368,000	38,971	1,267,000	1 ,, 11·27
'51	17,928,000	46,042	2,144,000	1 ,, 8·36

the average number of scholars was, in—

15,473 public schools, 93 each.
29,425 private „ 27 „

from a few schools no returns were received.

The date of the establishment of these *schools* is given thus:—

	Public.	Private.	Total.
Before 1801	2,876	487	3,363
1801 to 1811	599	443	1,042
'11 „ '21	1,120	1,087	2,207
'21 „ '31	1,265	2,217	3,482
'31 „ '41	3,035	4,432	7,467
'41 „ '51	5,454	16,760	22,214
Date not specified	1,169	5,098	6,267
	15,518	30,524	46,042

This statement of "existing schools" is qualified by a remark that many of the *private* schools especially were mere substitutions for others which, in some form or other, had previously existed, though the *public* schools would be of a more permanent character.

The computed number of children attending school between the ages of 5 and 15 years (p. xxi) is given as 1,768,000. The ultimate conclusion (p. xxix) is that the average attendance at

school for the working classes between 6 and 15 cannot much exceed three years.

I have space only for one other estimate, which is summarised from pp. xxiv—xxvi of this report:—

pp. xxiv—xxvi of this report :—

		[000's omitted.]
Total population 18 millions. Children between 3 and 15 (twelve years)	}	4,909,
Occupied in remunerative labour (382,000 males, 218,000 females) enumerated, 600,000.....		1,000,
At home and casually employed (estimated), 400,000	}	— 3,909,
Ill, &c., permanently, 5 per cent., 195,000; educated at home, 50,000		245,
		<hr/>
Further deducting for those between 3 and 5, and those casually absent	}	3,664,
		648,
		<hr/>
		3,016,

the result arrived at is that 1 in 6, or 3,016,000, should be on the books of some school. The return includes all classes, however, and is chiefly interesting as indicating the growing appreciation of the measure of school accommodation required. Although every care was taken in the enumeration, I think that, judging from the further experience gained by the detailed inspection in 1859-60 and in 1871, the number of scholars was probably overstated. Schools had become fashionable, and the natural bias was very general for every master to make the best of his own. The shortcomings as regards the quality of instruction are foreshadowed by the fact that 708 teachers, chiefly of dames' schools, and 35 of endowed schools, mostly small, signed their returns with a mark. There is no reason whatever to suppose that these schools as a class were better *then*, than they were shown to be by subsequent and more searching investigations.

17. Resuming the subject from Sec. 15, the next marked step was the allowance of "capitation" grants, first conceded (M., 2nd April, 1853) to rural districts of not more than 5,000 inhabitants, viz., of 6s., 5s., and 4s. for boys, and 5s., 4s., and 3s. for girls, in small (under 50), medium (50 to 100), and large (100 and over) schools; provided that an income of 14s. and 12s. respectively was made up from private sources. Attendance for four days for forty-eight weeks, subsequently reduced to one hundred and seventy-six days in the year, was required; school fees not to be less than 1d. per week, and the teacher to hold a certificate of merit. These grants soon afterwards were made, at the rate of 4s. for all, to schools generally. Wesleyan and Welsh schools also came in for a share of attention. Training colleges increased, and the staff of inspectors was strengthened. Some encouragement was also given to night schools, and the system of "half time" for those engaged

in actual labour was introduced. The Parliamentary grant was increased to 150,000*l.* in the years 1851-52, and to 260,000*l.* in 1853, as the work was very generally extending in many directions.

The following abstracts from the report for 1855-56 show the progress made up to that period. The statements are rendered for Great Britain, and include charges for workhouse and industrial schools, &c. I deduct the figures relating to Scotland, as in future returns only England and Wales will come under consideration, but the items cannot be so separated as to admit of exact comparison with later returns. The total expenditure from the education grants was, for the year ending 31st December, 1855, 310,962*l.*; from 1839 to 1855, 1,737,186*l.*, the costs of administration (partly for Scotland) being 12,163*l.* and 36,844*l.* respectively. Augmentation of salaries and building grants are the chief items. Another return in the same report shows—

	£	Per Cent.
Building grants paid, 1839-55	467,787	= 27
Subscribed by promoters	1,271,304	= 73
	<hr/>	<hr/>
Total expended (sixteen years)	1,739,091	100
	<hr/>	<hr/>

providing new or improved accommodation for 324,000 children.

Some time must elapse between the award and the payment of a building grant, and the cash account will always show a sum much less than the obligation incurred.

The number of schools reported as inspected for the year ending 31st August, 1855, was 3,853. Nearly 484,000 children were present on the day of inspection, and the average attendance was 467,000. The certificated teachers numbered 2,484, and the pupil teachers 7,120. These figures indicate comparatively large schools, the average present being over 125. Twenty-nine training schools are also recorded ("Report," p. 11) as under inspection.

18. The Order in Council of 25th February, 1856 (19 and 20 Vict., cap. 116) established the *Education Department* as now constituted. Under the Lord President of the Council, specially assisted by the Vice President, it took over the education establishment of the Privy Council Office and the Department of Science and Art which had previously been under the direction of the Board of Trade. It must be represented in both Houses of Parliament.

The work was now assuming a magnitude that called for the control of statesmen of the highest class. No new principle was introduced during the next few years, but the momentum gained may best be exemplified by giving figures from the report of

1861-62, which may be compared with those in the last paragraph, and must be received with the same qualifications:—

	£
Total grants for England and Wales (Table 1 B) to } 31st December, 1861	645,566
Total grants for England and Wales (Table 1 B) from } 1839 to 1861	4,627,849

Costs of administration had risen to 19,168*l*. Table VIIIA. shows the principal items in gross, amounting for all Great Britain to 5,936,000*l*. The specific grants to Scottish institutions are about 13 per cent. of the whole. A reference to sections 15 and 17 shows generally when the different items of outlay were commenced.

An abstract from Appendix Table I in this report gives the number of schools actually inspected in *England and Wales* for the year ending 31st August, 1861, as 5,438. Some of these comprised more than one department. The number of children present was 836,000, and the average attendance had been 754,000. The number of teachers and assistant teachers is given as 7,072, and of probationary and pupil teachers as 13,734. At foot is a summary of some further returns for the whole year.* 941 schools were also simply inspected without receiving a grant, of which 220 were in Scotland and 721 in England and Wales.

Some returns had appeared in the volume for 1860-61 (not repeated in the next year), reporting upon the quality of the instruction given, and generally on the discipline of the schools. These conveyed a very favourable impression. In about 7,500 schools or departments reading and writing are given as “excellently, well, or “fairly” taught, to about 90 per cent.; arithmetic to fully 83 per cent. of the pupils. Further, geography is described in the same terms as taught to 84 per cent. of the pupils in 6,529 schools; grammar to 74 per cent. in 5,826 schools; history to 82 per cent. in 2,455 schools; music to 93 per cent. in 493 schools; drawing to 95 per cent. in 659 schools. Other points, such as discipline, the teaching of apprentices, keeping of registers, and in church schools religious

* The report of the President and Vice President for the whole year, 1861, gives figures somewhat different, viz.:—

Schools or departments—		
2,281 Boys	} 566,333 Boys 462,357 Girls	Certificated teachers 8,069
2,260 Girls		Apprentices (pupil teachers) 15,498
4,739 “Mixed”		
9,280		
1,620 Infants only	1,028,690	Training colleges under inspection, 39, with 2,869 students
10,900		

These returns are for *Great Britain*. The figures above will afford the better means of comparison with those in Sec. 17.

instruction, are recorded in an equally favourable way. The Scottish schools included, somewhat raise the average, but they make up only 15 per cent. of the whole number. These reports were afterwards the subject of much comment.

19. A commission, over which the Duke of Devonshire presided, had been appointed on 30th June, 1853, to inquire into the state of popular education in England and Wales, and after an elaborate investigation, finally gave in its report on 18th March, 1861. Time will not permit me to enter upon the merits of this most valuable and interesting document. I must confine myself to noticing its effects on the legislation, and on the subsequent administration of the parliamentary grant. Lord Granville, the President of Council, ("Hansard," 13th February, 1862) based his argument on the fact that 2,200,000 children ought to be at school; 920,000 children actually attended; of these only some 230,000 children received what might be called adequate instruction in reading, writing, and arithmetic; and that even "these carry away from the common schools an amount of instruction that gives little hope of their retaining long after they have left even that little." He stated also that among them were to be found many really of the middle class to which the Government grant was never meant to apply; and that only the first, or at best the first and second classes, were duly examined. He pointed out also that under existing rules 68 per cent. of the expenses of training colleges fell on the State.

Mr. Robert Lowe, the Vice President, in the House of Commons, urged that under the existing system schools were very irregularly placed, that not more than one-fourth of the pupils were really well taught; that the terms of commendation applied to the teaching could not mean to imply that the subjects were equally well learnt; that inspection as opposed to (or without) examination was not a sound test of efficiency. A minute of 1853, requiring individual examination, had practically become a dead letter. H.M.'s Inspectors, he complained, had dealt in generalities, while the commissioners, who came to different conclusions, dealt with more specific facts—"What we do not learn from the reports (of the former) was the result of the labours of the teachers, and the amount of trouble and toil they bestowed on the children." Further, the opponents of the change did not urge that the proposed individual examination was needless or over costly, but that such a test would be ruinous to the schools. The vote required was 802,000*l*.

20. The whole subject was long and keenly, indeed, acrimoniously, debated, and it was not without considerable concessions that the "revised code" was passed. Under it the entire system of what may be termed open grants to managers for the

payment of teachers was swept away. The requirements were on a very moderate scale, but dependent upon the results of *individual examination* in the "three R's." "Building grants" were continued, with some modifications, for schools and teachers' residences, but *not* for training colleges; and allowances, still on a liberal scale, in aid of their current charges, were made partly dependent on the ultimate success of their scholars. The danger of vested or quasi-vested interests growing up was imminent; and the condition of educational endowments showed how necessary it was that those who drew on the public purse should give valid proof that the service rendered in return was both efficient and suitable. But the change imposed new and most irksome duties both on managers and teachers. H.M.'s Inspectors also had, in the first instance, to carry out both the general "inspection" and the individual examination of all children over 6 years old, for the department deemed that this "experience must first be gained "by the higher class of officers." (Letter, September, 1862; Report, 1862-63, *passim*.) So bitter and lasting was the opposition, that in 1864 a charge of mutilating their reports was brought forward and carried in the House of Commons against Mr. Lowe, who in consequence resigned; but after full investigation and report by a committee chosen from both sides of the House, this resolution was rescinded, and he resumed his office of Vice-President. Some of the inspectors seem to have disregarded the minutes laid down for the guidance of the department in 1861, and to have been disposed to constitute themselves advocates or arbiters in the cases coming officially before them. Still, though the measure caused much dissatisfaction in some quarters, many good workers found their advantage in its provisions. The sums paid by the department on school returns decreased from 430,000*l.* in 1863 to 353,000*l.* in 1864, and did not till 1868 exceed the former amount, while the number of schools, of children presented at inspection, and of private contributions from all sources, showed a steady increase, as shown in Statement IV in the Appendix.

21. Hitherto it has been difficult to find consistent numerical statements which even fairly illustrated my subject. The entire want of any common standard of fitness for the schools just referred to, either as to rooms, appliances, or the results obtained, induces me to omit these figures from any formal comparison with later returns. Now we have arrived at a time when many important results can be shown by statistical tables, but even for the statements appended, those periods have had to be selected for which consistent and complete returns were available. I have summarised those figures only which seemed necessary to show the

general course of the movement. Full returns are to be found especially in the later reports of the Education Department.

Minor matters I am compelled to omit, and shall only be able to glance back partially at a few of them hereafter. Note I in the Appendix gives briefly the general features of the several codes, and Statements II A to G, III, and IV, commencing from this period, show the number of schools inspected, of children on the registers, and of their attendance, the results of individual examination, the number of teachers engaged, the amount of annual grant, and of income from other sources.

22. In the early part of this paper I recorded the successive abortive attempts of legislation up to 1868, but the time for such action had at length arrived, and "An Act to provide for Public Elementary Education in England and Wales" [33 and 34 Vict., cap. 75] was passed on 9th August, 1870. It ordained that "there shall be provided for every school district a sufficient amount of accommodation in public elementary schools, available for all children resident in such district for whose elementary education efficient and suitable provision is not otherwise made." The Act required that a copy of the "conscience clause" should be conspicuously put up and duly observed in every such school, and that it should be open at all times to the visits of H. M.'s Inspector; but the Education Department were charged with the duty of determining the fitness and sufficiency of existing schools, and of those which might be supplied within a specified time by voluntary exertions. Failing this supply, an order issued for the formation of a school board, to be elected by the ratepayers of the district. Failing such election, or if the board chosen does not satisfy the requirements made upon it, the department can, as a last resource, nominate a board to carry out the provisions of the law. A school board is also empowered to appoint officers to enforce any bye-laws (sanctioned by the department) as regards the attendance of children between the ages of 5 and 13 years.

There was nothing in its provisions the principles of which had not been discussed over and over again. It had no pretensions to ideal perfection. Anyone who wished to criticise might point out its theoretical imperfections. Anyone who wished to work could work under it and avail himself of the aid which the Education Department was willing to afford.

23. It should be clearly understood that proceedings under this Act, and those which had been carried on for so many years under the system of annual grants, were quite distinct. No doubt the department looked forward to the time, which has indeed practically arrived, when schools generally should come under the stricter rule,

and reap the pecuniary and other advantages of the latter, but its first approaches to this end were cautious and considerate, but very thorough. There was no perfunctory work done by accepting local estimates of local deficiencies. H.M.'s inspectors, largely aided by "Inspectors of Returns," specially appointed for the purpose, reported specifically on every parish and district throughout the kingdom. A sixth of the population in some cases and in the absence of precise information, was accepted as the number of children to be provided for. The data on which this estimate was based are these: Of a population of 700, *one-seventh* were taken as of the class which would not require such schools, leaving 600. The average number of children between the ages of 3 and 13 (ten years) is 23 (more exactly $23\frac{1}{2}$) per cent., but allowing about 15 per cent. for absences from various causes, accommodation for one-fifth, or 20 per cent., only was accepted, *i.e.*, for 120.* The sixth of the whole is 116, and the difference on the average is not very important. But fallacy lurks in the application of general averages to local conditions, and the better practice was to take the total census population as the *charge* or *debit* of the account, and to write off in *discharge* (a) the richer classes, and (b) the members of any hospital, workhouse, or any such institutions not pertinent to it, as disclosed on local inquiry, making the requirement for one-fifth of the remainder. So far exact data were acquired by the department, though many points of detail remain open to discussion. The minimum space required was 8 square feet per child, though the plans supplied and recommended by the department allowed 10 square feet. The provision for children under 5 was rendered necessary by existing custom: to exclude them was to exclude elder children, who would have had to stay at home to take care of them, and moreover there is no doubt that even at that age a cheerful and judiciously managed infant school is a great boon.

Certain conditions for health and decency had also to be satisfied in the buildings.

It has often been alleged that good schools were needlessly and ruthlessly superseded. I append, therefore, the text of the Standards,† and a memorandum of the conditions, under which

* Centesimally the calculation runs: six-sevenths of 1,000 = $857 \div \frac{1}{6} = 171$.
 Of these "infants" 3 to 5 below school age $21\frac{3}{4}$ per cent. 37
 " "children" 5 to 13 of " $78\frac{1}{4}$ " 134
 ————— 171.

† STANDARD I, Code 1870, 6 to 8 years old—

Reading.—Narrative in monosyllables.

Writing.—Form on blackboard or slate from dictation, letters, capital and small, manuscript.

Arithmetic.—Form on blackboard or slate from dictation, figures up to 20; name at sight figures up to 20; add and subtract figures up to 10 orally from examples on blackboard.

these schools were really examined. The reading in the highest test standard required was strictly from a child's book; you would search in vain through the columns of a newspaper to find two or three consecutive lines sufficiently simple for the purpose. No ragged or village school, if otherwise suitable, which did not fall below this very low range of very partial attainments, was refused recognition as a public elementary school.

By far the larger number of uninspected schools, however, did not come up to this standard. Many of the buildings were unsuitable, and in most districts the quantity of school space was inadequate, except indeed where denominational rivalry had duplicated the supply. Some exceptions there certainly were, scattered irregularly over the country, where private liberality, aptitude, and individual energy had worked most efficiently without any extraneous aid, and some few of these may still remain outside of the system. There are no reports to show how many schools were rejected as insufficient, inefficient, or unsuitable, and there is no doubt that there are districts where the provisions of the Act were very barely met, and are very uncertainly maintained; but speaking broadly, so largely and continuously has the better education of the people grown round the central line of Public Elementary Schools under inspection, that we may take the extension of the inspected schools as the measure of progress made.

The Summaries Nos. V and VI show the rapidity of the increase both in aggregate numbers and in those, over 7, subject to individual examination, and No. VIIA to C shows the comparative distribution of the grants made directly to Schools for 1870, 1875, and 1882 respectively. Table VIIIB and C shows the total outlay in 1870 and 1882.

STANDARD I, Code 1871, 8 to 10 years old—

Reading.—One of the narratives next in order to monosyllables in an elementary reading book used in the school.

Writing.—Copy in manuscript character a line of print, and write from dictation a few common words.

Arithmetic.—Simple addition and subtraction of numbers of not more than four figures, and the multiplication table to multiplication by 6.

STANDARD II, Code 1871, over 10 years old—

Reading.—A short paragraph from an elementary reading book.

Writing.—A sentence from the same book slowly read once, and then dictated in single words.

Arithmetic.—The multiplication table and any simple rule as far as division.

Fifty per cent. of the number in average attendance for the previous year, from 6 years old, to be individually examined.

Fifty per cent. of the children so examined ought to pass in *two* subjects.

Fifty per cent. of the children above 10 examined in Standard II (or upwards) ought to pass in two subjects.

Fifty per cent. of the children so passing must pass in arithmetic.

24. Of the Acts passed since 1870* affecting primary education, that of 1876 only calls for special notice in this context.

Under the Act of 1870 (extended in 1873 and 1880) "bye-laws" had been passed affecting 23 boroughs numbering 5,590,000, excluding London, and 2,346 parishes numbering 4,000,000; in all about 55 per cent. of the entire population of England and Wales, and 90 per cent. of the urban population including London.† By the Act of 1876 "School Attendance Committees"—appointed annually by the council of a borough, or by the guardians of the union for a parish—are vested with the same powers and responsibilities as school boards in regard to making and enforcing bye-laws regulating the attendance of children at school, and fixing the standards to be passed and conditions fulfilled to warrant the employment of a child in regular labour.

It rendered the formation of bye-laws compulsory, but much latitude was at first given to local discretion in fixing the "labour standard." The *minimum*, however, was determined as the second standard of the code for the years 1877 and 1878. The third for the years 1879 and 1880. From and after 1881 the minimum standard is the fourth, provided always that no higher standard is or has been ordained by existing local bye-laws. The inspectors of factories and workshops have to see that children are not kept at work for more than legal hours; but this Act is not designed to restrict needlessly any casual employment of children which does not interfere with school attendance.

The precise conditions of a child's employment, and of his obligation to attend school, are still somewhat complex, especially between the ages of 13 and 14, which latter is made the legal limitation of "childhood" by the Act of 1876. Memorandum XII has been carefully drawn up to show the general working of the various legislative provisions now in operation, and to this I would specially refer.

A copy of the Code Standards of 1881, in force till April, 1883, will also be found at the end of the Appendix.

25. *Factory Schools* have been absorbed in the Public Elementary Schools. They did good service in their time, and may justly

* Act 36 and 37 Vict., cap. 67, "Agricultural Children's Act, 1873," repealed in 1876; Act 36 and 37 Vict., cap. 86, amending Act of 1870, &c. (1873); Act 39 and 40 Vict., cap. 79 (1876), further provision for Elementary Education; Act 43 and 44 Vict., cap. 23 (1880), further provision as to bye-laws, &c.

† The census of 1871 gave metropolitan district

224 municipal boroughs

9,799,000
14,082 civil parishes 12,913,000

In all 22,712,000

be acknowledged as having led the way in the day of small things. Our common schools also owe much to the experiences gained in *Workhouse* and *Industrial Schools*. The latter will probably always remain as just outside, but touching, the general system. As regards the latter, the "*House*" where the destitute and the orphan find refuge is not necessarily, probably not beneficially, associated with special school teaching. Table X_A shows that about 7,000 out of 43,000 of these children are already sent out to school, and this fusion with the independent population tends to increase rapidly. The special provision for pauper children in London is also set forth in Table X_B. Part of this also should eventually be brought into connection with a more complete system of popular education.

26. Since 1871 grants for "specific subjects" (Art. 21)* have been made (but only to pupils in the Standards IV to VI), with the object of encouraging a higher range of culture. About a third of the departments, and nearly the same proportion of pupils, availed themselves of aid in this form last year. As will be seen by Table VII, they receive a very small portion of the aggregate grant. As a rule the better and stronger schools take them up, and there is no reason to suppose that the lower standards in any way suffer from this extension of instruction. Indeed as a safeguard the whole grant was forfeited if 75 per cent. (but in the New Code of 1882 reduced to 70 per cent.) of the whole number do not pass in the "three R's." These differ altogether from the grants payable since 1875-76 on a *general* examination of children in classes (see Memorandum I on the Codes): which were designed to promote a more liberal tone of instruction throughout all classes of the school.

The Science and Art Department has also lent its aid to the higher instruction in elementary schools. 632,000 pupils out of 851,000, in 5,097 schools, were examined, according to its last report, with fairly satisfactory results. 1,062 students in training for teachers, and pupil teachers also obtained certificates in drawing in forty-eight training colleges. Freehand drawing, both from copies and models, and geometrical drawing, are included in the earlier stages, affording good training for the hand and eye,

* These specific subjects are by Schedule IV, Code of 1881:—1. *English Literature*. 2. *Mathematics* (up to first and second books of Euclid) and *Elements of Mensuration*. 3. *Latin*. 4. *French*. 5. *German*. 6. *Mechanics*. 7. *Animal Physiology*. 8. *Physical Geography*. 9. *Botany*. 10. For girls *Domestic Economy*, (a) Clothing, ventilation, management of the sick, &c.; (b) *Food*. Nutritive value of foods, &c., and cooking. Two of these subjects only may be taken up. The choice rests with the managers, mere learning by rote is not accepted as sufficient for a grant. Of course the wide range of choice is meant to include schools under many different conditions in all parts of the country.

which, in many districts, also opens up the way directly to a wage-earning trade.

Special science classes were also held in thirty-seven of the training colleges, showing marked improvement of late years. Grants are given in furtherance of these objects.

27. But upon this branch of the subject time will not permit me to dwell. I must confine myself to popular education in the sense of appropriate training carried down to the great mass of the people, though most fully recognising the importance and the indissoluble connection between both sides of our duty. The public elementary school system must equally keep up the touch with the industrial school on the one hand, and with the "intermediate" and higher schools on the other. The greatest shortcomings in England affected both the vast numbers of the wage-earning class, and also the most important section which, for want of a better term, I must call the lower middle class. Exceptional strength, ability, and good fortune might rise above the mass; but it is not the less true that a very large proportion of the lower schools of all grades, from first to last, were deplorably inefficient. Much has been done; many excellent schools have been established; but our task is still far from complete. This short sketch may help to show how slow the nation was to realise either its importance or its magnitude. Though certain very old principles have gradually won their way into practice, the work done has essentially been a development on the lines of the least resistance, and the temporary survival of the fittest has had, and will yet have, to give place to forms better adapted to the growing wants of the country.

There has been resistance, both active and passive, on all sides: often unity only in the adoption of remedies totally inadequate to the evil. An admiration of ignorance as proper and desirable for the "lower orders;" sordid parsimony; faint heartedness; the impracticable pedantry which makes "the best the enemy of the good;" the desire of finality which sees in the goal of to-day not the starting point but the resting place for to-morrow; even the natural desire of an uneasy conscience to accept any colourable assurance that things were not really so bad as they were represented to be:—these, and such as these, were the hindrances which tended to thwart and minimise the efforts of those who strove to do in their generation the work which their generation was fitted to receive.

28. Scant justice will be done to those who have carried on the work of popular education, if we do not realise the enormous amount of labour entailed by the continuous absorption of a large proportion of children whose training even up to the age of 10 or 12 had been

almost entirely neglected. Ten or fifteen years ago, managers of the better class of schools had to deal with *comparatively* a select few, and these for the most part under better home influences. We must not take the "street arab" as a type; *they* are the most active and vigorous of their class, and, in rough ways of their own, are training their wits, if not acquiring learning. It is the common run of less energetic children who suffer most from the want of aid in training those faculties of observation which nature is ready to develop in very early days. The heart breaking work has been to deal with those who have never acquired the habit of taking notice of things around them. Perhaps Table IX affords the most striking (and certainly a not too lenient) test of the work done by inspected schools. Out of the estimated number of children between 7 and 13 who might have been at school, it shows that in 1872 only 42 per cent. were on the registers, and 14.6 per cent. passed in *all* the three R's. In 1882 no less than 91 per cent. were on the registers, and 41 per cent. passed this test of successful work in these essential elements. But if we give credit to the past for the way in which this great difficulty has been met, we must on the other hand look for better results now this difficulty has in so large a measure been overcome, and above all take care that inefficient working in neglected quarters does not prolong an evil which due vigilance will well nigh eradicate.

29. Underlying the whole subject, is the question of what should be the position of the State in regard to schools. Ardent educationalists vehemently denounced the "revised code" of 1862 as degrading. The position of Mr. Lowe as regards school managers I have always taken to be this: The State does not assume the control over your schools. It will not organise a vast central establishment to regulate in detail the thousands of schools coming into existence all over the country. But if you do certain definite work which the State requires, it will give you certain grants in aid on proof that the work is suitably done. The first proposal that children should be examined according to ages and not according to classes, shows that a valid test of this kind only was required. Objectors most truly urged, "if you aim low you will fail, and "deserve to fail." The attempt to teach the three R's. in the abstract without associating the use of them with things familiar to the child, is a most impracticable absurdity. But surely this warning should have been addressed rather to managers. But this truth was not brought home to *them*, rather they were encouraged to look to the State to undertake what they only could do for themselves. A phrase was very current ten years ago in this context, "that the tendency of a minimum is to "become a maximum." Granted, especially as regards giving half-

hearted service, but the exact reverse holds good when the receipt especially of public money is concerned. I hold that the establishment of this principle of payment on definite results was the salvation of the system; and this does not imply that subsequent modifications of the code of 1862, when this principle was once firmly established, were not timely and judicious. This insistence upon carrying down teaching to the many, first led us to realise the incalculable importance of training in the special *art of teaching*. It is this, and this only, that has made and will make popular education a reality. It is no new idea, but the vitality of it diffuses light through all those dark places which are an opprobrium to civilization. It is not the mere art of teaching the three R.'s to stupid children, though that practical duty had much to do with calling forth the latent powers of many a true teacher; whenever such an one can call forth a response from an uncultured mind, the way is open for it to receive not indeed all knowledge, haply only a very small modicum of knowledge will fill the measure of its capacity, but be it more or less, the learner will gain wisdom by realising the limit of his own powers. It is those whose vague aspirations have never been restrained by this practical experience, who become dangerous members of society, and failures in all the various callings of life.

And this great faculty of true teaching which gained strength in this humble sphere, is spreading its beneficent influences in higher ranges. It is acknowledged in the universities, and places our national education on a basis as broad as that of humanity itself. I cannot express this result in figures, but it enhances the value of every figure that represents educational results.

30. I will add a few words only as to the future. A *new* code was published in 1882, which is now coming into effect. It lays down a seventh standard, which may well be passed at 13 or 14, and practically continues the full advantages of the grant-in-aid for an additional year. The lower standards are verbally modified, certainly not in the direction of increased stringency, and it is not to be supposed that a "complete pass" implies that no mistakes have been made in the test exercises given. Two sums, for instance, right out of four, would be probably accepted according to recognised custom as satisfying the *minimum* requirement. The "specific" subjects are confined to Standards V to VII. Higher fees may be charged for the higher standards, but they must cover all the instruction given to the scholar. The tendency is evident to divide schools, or rather the better class of them, into two divisions: for those who leave on passing the "labour test" of the fourth standard (under some bye-laws the fifth) at 10 or 12, and those

who can and will afford to attend school for two or three years longer. The conclusion expressed in the report of the *Schools Inquiry Commission* in December, 1867, still holds good to a large extent, viz. (cap. 2, p. 103), "For boys who are intended to finish their education at 14, there is very little public education excepting in the upper class of a National or British School or in an endowed school of the same general standard, but frequently of inferior quality."

The subject of lower middle class education must ere long be treated energetically and as a whole. The question of endowments is so important, that I have drawn up a summary of those coming under the Charity Commissioners by the Acts of 1869 (32 and 33 Vict., cap. 25) and 1873 (36 and 37 Vict., cap. 87). It is based on the last return to the House of Lords (Earl Fortescue's, 2nd July, 1880), which, by the courtesy of one of the members of the Commission, I have been able to carry on to March last. I have tabulated it according to the census districts (with an index for reference to counties), which in some measure coincide with natural divisions of the country. [Table XI.] 450,000*l.* out of a total income of 612,000*l.* have been, or are being, dealt with, and under the powers of the Act of 1869 (Secs. 29 and 30), charitable uses which have become wholly or partially obsolete or mischievous may be applied to educational purposes, so that further income may yet be found available. The larger portion of these funds go however, rather to higher education, though some very valuable middle class schools have been established under the schemes of the Commission. They are, however, very irregularly scattered over the country. The importance of the subject can hardly be over-rated, even if we were to regard only the reflex effect which intermediate schools must have on primary education, though other and most weighty considerations cannot for a moment be ignored.

The numbers directly concerned are comparatively few, and in rural districts spread over a wide area. To deal effectually with this and many other great questions, the organisation of *local government* is urgently required, and it is much to be desired that educationalists should take more interest in a problem which so nearly concerns them. Speaking generally, we want less interference with matters of detail, and the responsibility for a due discharge of legally acknowledged duties more stringently enforced. We do not want to restrict individual action, but to promote and regulate voluntary organised local action in due co-ordination with and subordination to, the central administration, which so much needs a concentration of its much diffused energies within their appropriate sphere. But this is far too broad a question to enter upon here.

Of minor matters I must refer to the development of the *half-time* system. Sending a child for half days or for alternate days to a school organised for whole time, does not give this method fair play. In some exclusively manufacturing towns, schools have necessarily to adapt themselves to "half-time;" but this plan is only very partially carried out. But surely in all the larger towns, at all events, schools with a curriculum duly fitted to the attendances the pupils can make, could be established; and these efficiently worked will become the adjuncts to *technical* schools and to evening "continuing" schools, which shall preserve and carry on the small modicum of learning expressed in the fourth standard. Ten years ago the *evening* school was often proposed, in a very different sense, as a substitute for the day school. In other words, very young children, tired out with a long day's work, might be sent to school instead of being sent to bed. An old official recommendation, which painfully affects me with a sense of unreality, is that teachers should hold schools three times a day. Of what kind of flesh and blood were they supposed to be made? But to open school once only during the day leaves time and strength for the evening work. It is no excuse to urge that this plan is *not* universally applicable. Why should we aim at uniformity when the conditions with which we have to deal differ so widely as they do? We must fit our tools to the work.

It may also be found feasible to extend more generally the benefit of the technical training now given to the older children in some of the *district schools* under the Local Government Board. See Table XB. The advantages afforded to the class housed in these schools ought not to be beyond the reach of any who are willing to deny themselves for the benefit of their children. There is much truth in another remark in the report just quoted, "that the boarding school is most requisite where it is least available, viz., in the lower ranks" (p. 48); and a year or two of such thorough training as such institutions, duly modified, could afford, would do much to raise the industrial standard in the country. The difficulty now is the association with pauperism and the expense, which comes to 8s. to 10s. a week, all told. But if these schools were aided, as other schools are, to maintain their teaching staff and appliances under suitable conditions, a charge not too much exceeding that which a child costs at home, would be better within the means of the poorer classes. After all, it is the community at large which benefits by the establishment of higher standards of efficiency.

Above all things, no gaps must be left in our work. No complete reports on the state of primary education throughout the whole country have been made since the first returns under the

Act of 1870. The tables I have been able to construct summarise only the average results obtained by schools which have voluntarily come under inspection and secured the annual grant. No account is taken of other districts or of the schools in them; and no one can say how large are the exceptions, either in town or country, which fall far below the average standard. The differences even in inspected schools are still very great, not as regards their adaptation to local needs—on that side too much uniformity is rather to be apprehended—but directly as regards their efficiency in teaching the common rudiments of learning. We know very well that good schools on all sides are very much above the average shown; the inference is obvious. It is true that the “labour test” has a great and most beneficial effect; but if schools are inefficient, the result is that when the unfortunate pupils cease to be of the age of “children,” they pass out in ignorance; and more and more every year an even stronger law than that in the statute book and the codes visits such ignorance with a heavy penalty. Those who are engaged in the beneficent work of helping the destitute to find employment, know best how greatly the difficulty is increased in getting a place even for a well-grown healthy lad if he has not acquired these elements, which are part of the common language of civilised industry.

Above all things, I repeat, let our work be “thorough;” especially where school days are so few, bad work in the early stages—often shown only by complaints of over work later on—is an irreparable evil. Whoever may again take up this subject in the course of the next decade, should be able to present a far wider range of trustworthy statistics, affording more searching tests, that, to use a well known and expressive phrase, the nation is being “well taught throughout.”

APPENDIX.

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I.—*Memorandum regarding the Codes.*

These codes (like the Prætorian edicts of old) are published annually, with such revisions as changing conditions and practical experience prove to be desirable. The object of examination is, of course, not to secure a knowledge of the necessarily limited range of subjects indicated, but to afford as fair and valid a *test* as possible of the suitableness and thoroughness of the instruction, not only offered, but actually imparted to the pupils. A memorandum appended to each annual issue of the code makes it easy to trace these modifications, but from time to time a fresh departure is taken and a "*new code*" systematically constructed. No attempt is here made to notice the minor changes made.

The "revised code" first made the payment of the grant in aid chiefly depend upon the *individual examination* of all children over 6 years old. It was finally passed 9th May, 1862, and came into operation partially in 1863. The chief items were:—

For *all* on the number in "average attendance," 4s. per scholar.

Infants under 6 years old, who had attended not less than 200 times, morning or afternoon, 6s. 6d., if suitably instructed.

Children over 6 years old, same attendance; 8s., subject to forfeiture of 2s. 8d. for failure to pass an examination in the standards of the code. The first standard required: *reading* monosyllables; *writing* capital and small letters, "pot hooks" and hangers;" and for *arithmetic* addition and subtraction of figures up to ten. The sixth standard, which, with due progress, should have been passed at the age of 11 or 12, required reading and writing from dictation "a short" "ordinary paragraph from a newspaper or other modern" "narrative," and "a sum in practice or bills of parcels."

The new code of 1871 abolished the former first standard for children of 6, making individual examination commence at 7, with a text for reading in a very elementary reading book "used in the" "school"; forming letters and copying a line or so from a printed book; with simple addition and subtraction, with not more than four figures. The Standard VI, normally for those of 12 to 13 years old, required reading with "fluency and expression," writing a short theme, letter, or an easy paraphrase, with arithmetic up to proportion, and decimal or vulgar fractions. The grants for schools which had met not less than 400 times (morning and afternoon counted separately) were:—

For *all* 6s., on the number in "average attendance."

Infants 10s. if in a separate school, and 8s. if only in a separate class or department; and satisfactorily taught.

Children over 7 years old, who had attended not less than 250 times (for those under "Half-time Acts," and regulations, this condition was relaxed) 4s., on passing an individual examination in reading, writing, and arithmetic; 12s. in all. The first named grant of 6s. was subsequently divided, 1s. of it specifically depending on the teaching of singing; and 1s. on a *good* report on "discipline and organisation."

The code of 1875 made no change in the grant for "average attendance" for all, or for that for infants; but for children over 7 reduced the payment for passes on individual examination in the "three R's" to 3s., and introduced a grant, calculated on "average attendance," of 4s. per scholar, "if *the classes* from which the "children were examined in Standards II and VI passed a credit-able examination in grammar, history, elementary geography,

“and plain needlework, or in any two of these subjects;” subsequently (1878) 2s. was given for either one of these, but not *more than* two might be presented. This grant was liable to reduction if the teaching in the “three R’s” was not duly carried out.

N.B.—This class examination is not to be confounded with the grant of 4s. each for not more than two “*specific subjects*” of a higher character, accorded only to those in Standards IV to VI on individual examination, and withheld altogether if the passes in the “three R’s” throughout the school generally fell below 75 per cent.

* * * The *new code* of 1882 has not yet come into operation, and need not be noticed here.

Some explanation regarding general technical terms may be useful.

Registers were probably more accurately kept as schools came more efficiently under inspection, if so, the true rate of increase was somewhat greater than that shown in the published returns.

Average attendance is found by dividing the sum of scholars attending during the year by the number of times during which the school has been opened. Before the revised code the day was the unit, though half days were counted in. Since that time morning and evening count equally in making up the number of attendances. The low “*average attendance*” as compared with the numbers on the *Register*, indicates frequent absences from school.

The “*qualification*” of children over 7 for examination (required on the same principle that residence as well as examination are insisted upon for a degree), implies an attendance of not less than $\frac{250}{400} = \frac{5}{8}$, or $62\frac{1}{2}$ per cent., *i.e.* three days (or six half days) in the school week of five days, ten weeks being allowed for holidays. Those under half-time Acts may fulfil the requirement by attending less than two days (four half days) in the week. Schools *must* be opened 400 times (usually 420) in the year.

No. 2A. The first report in 1863, after the introduction of the “revised code,” gives a return of 180,005 children examined. This is certainly less than half the number over 6 who should have been presented, and is not likely to afford results less favourable than would have been shown by an examination of the whole:—

II.—*Statements showing Number and Proportion of Children in England and Wales presented for Individual Examination under the Standards of the Several Codes.*

Standard.	Number of Children.	Percentage on Whole.	Failed in		
			R.	W.	A.
I	70,407	39'11	Per cent. 20'0	Per cent. 17'68	Per cent. 26'77
II	45,180	25'10	10'85	8'05	25'25
III	35,991	20'00	6'4	15'35	18'95
IV	22,137	12'30	4'6	19'62	18'28
V	4,671	2'59	5'35	14'11	16'98
VI	1,619	0'90	5'93	12'85	16'49
	180,005	100'00	—	—	—

Showing $84\frac{1}{4}$ in Standards I and III, and $15\frac{3}{4}$ in Standards IV to VI. But Standard IV of this code is rather lower than Standard III of the subsequent codes. Omitting the superseded Standard I we have:—

II and IV	103,308	$= 94\frac{1}{4}$	} As approximately fairer data for comparison as to range of instruction afforded.
V and VI	6,290	$= 5\frac{3}{4}$	
	109,598	100	

No. 2B. The report for 1869 shows 843,000 children qualified (by attendance), and $82\frac{1}{2}$ per cent. = 696,000, examined, viz.:—
[000's omitted.]

Standard.	Number of Children.			Passed without Failure.			
	In 1,000's.	Under 10.	Over 10.	Number.	Per-centage.	Number.	Per-centage.
Code of 1862	I 215,	404,	—	287,	= 71	371,	= 70 $\frac{3}{4}$
	II 175,						
	III 132,			—	119,			84,	= 70
	IV 91,	26,	—	15,	= 58		
	V 53,						
	VI 30,			147,	85,		
	696,	530,	266,			100,	= 58
						471,	

Applying the test as in the statement for 1863, we have:—

Standards I and III, 75 per cent.; and Standards IV to VI, 25 per cent., or
 „ II and IV, $398,000 = 82\frac{3}{4}$; Standards V and VI, $83,000 = 17\frac{1}{4}$ per cent.

No. 2c. Under the code of 1871, the proportion of children over 10 presented in Standards I and III (see above) has gradually, but not quite uniformly, decreased. Quinquennial returns show—

	Total Examined in Standards	Number over 10 Years.	Proportion over 10 Years Examined in Standards I and III.	Total all Ages Examined in Standards IV to VI.
	(In 1,000's).			
1872	662,	319,	63·71	17·96
'77	1,335,	655,	59·59	20·25
'82	2,119,	1,063,	44·36	28·26

Note.—Memorandum of passes in the several standards is given below.

No. 2D. Memorandum of passes in Standards of the code, in 1872, 1877, and 1882; showing proportion of those who have *passed* completely (*i.e.*, in reading, writing, and arithmetic) according to the several standards, and of those who passed in two only of these subjects in 1877 and 1882:—

	I.	II.	III.	IV.	V.	VI.	General Average.
1872.							
Over 10 years old	67'40	64'43	52'68	55'95	56'93	48'33	—
Under 10 „	63'38	64'64	53'08	58'93	65'91	89'66	—
1877.							
Over 10 years old	61'82	60'92	52'94	52'34	50'22	48'26	} —
Passed in two subjects	21'28	23'62	28'81	30'99	30'36	35'32	
Under 10 years old	59'27	64'71	56'53	55'34	56'99	45'46	
Passed in two subjects only	20'79	22'71	28'39	31'87	26'43	9'09	
1882.							
No distinctive return as to age	69'3	69'48	65'2	57'98	60'32	61'41	65'03
Passed in two subjects only	16'29	19'64	24'58	27'82	27'4	10'02	22'15

Note.—The record of passes at different ages is no longer recorded. Those examined at or about the normal ages appear to have done best.

No. 2E. Statement giving the proportionate numbers presented in Standards I to III, and IV to VI respectively, as given for each year. The decrease from 1872 to 1874 may be attributed to a pressure of untaught children coming into the schools greater than the teachers could meet immediately. If the school age be taken for these standards as 7 to 13, the normal proportion would be 51'7 for the former, and 48'3 for the latter:—

Standards.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.
I to III	82	82'5	82	80	79'5	79'75	79'25	78	75'33	73'15	71'75
IV to VI....	18	17'5	18	20	20'5	20'25	20'75	22	24'66	26'85	28'25

N.B.—*The bias, owing to the operation of labour Acts and the natural desire to earn wages, is to overstate ages, especially about 9, and 13 to 14. The number of children over 10 will accord rather with the first enumeration than with the corrected returns of the census.*

No. 2F. The numbers and proportions in the several standards quinquennially shown are :—

[Numbers in 1,000's.]

Year.	Standard I.			Standard II.			Standard III.			Standard IV.		
	Total.	Over 10.		Total.	Over 10.		Total.	Over 10.		Total.	Over 10.	
		Num-ber.	Propor-tion.		Num-ber.	Propor-tion.		Num-ber.	Propor-tion.		Num-ber.	Propor-tion.
1872	229,	47,	18'1	172,	75,	43'6	111,	82,	73'9	67,	64,	95'5
'77	463,	72,	15'6	346,	138,	40'0	256,	181,	70'7	158,	152,	96'2
'82	570,	50,	8'8	506,	147,	29'0	445,	60,	13'5	347,	339,	97'7

Note.—These proportions in the several standards are very significant. The progress in IV cannot as yet be regarded as satisfactory. Over IV, presentation before the age of 10 is, and should be properly the exception.

2G.—*Number of Teachers Employed in Inspected Public Elementary Schools.*

	1870, Revised Code.	1872.	1874.	1876.	1878.	1880.	1882.
Certificated teachers	12,467	14,771	18,714	23,053	27,324	31,422	35,444
Assistant „	1,262	1,646	2,489	3,173	5,480	7,652	10,071
Pupil teachers	14,304	21,297	27,031	32,231	34,399	33,733	28,285
Female Assistants } Art. 32, C. 3 }	—	—	—	543	1,698	2,352	2,603
Stipendiary monitors	—	—	—	—	—	558	306

Note.—An “assistant teacher” is equivalent to two pupil teachers.

The codes of 1878 and 1880 restricted the employment of pupil teachers in undue proportion.

TABLE III.—*Showing the Ages of Children on the Registers of Inspected Schools; also the Numbers and Proportion of those in Average Attendance, and those Present at the Annual Inspection.*[Abstracted from Return (Mr. H. H. Fowler) to House of Commons,
20th March, 1883.]

[000's omitted.]

Year.	Ages.		Total Infants.	Ages.			Total Elder Child- ren.	Totals <i>all Ages.</i>		
	Under 5.	5 to 7.		7 to 10.	10 to 13.	13 and Over.		On Register.	Average Atten- dance.	Present at Inspection.
1863	No particulars rendered in this form.*						—	799,	884,	
'67	221,	295,	516,	481,	309,	53,	843,	1,359,	912,	1,125,
	16·28	21·69	37·97	35·40	22·74	3·89	62·03	= 100	58 p.c.	72 p.c.
'72	287,	457,	744,	692,	560,	73,	1,225,	1,969,	1,336,	1,608,
	14·61	23·18	37·79	35·15	23·36	3·70	62·21	= 100	68 p.c.	81 p.c.
'77	397,	703,	1,100,	1,092,	838,	125,	2,055,	3,155,	2,151,	2,633,
	12·58	22·29	34·87	34·60	26·56	3·97	65·13	= 100	68 p.c.	83 p.c.
'82	416,	899,	1,315,	1,475,	1,195,	205,	2,875,	4,190,	3,015,	3,543,
	9·94	21·44	31·38	35·21	28·53	4·88	68·62	= 100	72 p.c.	84 p.c.

* Previous returns of ages had been made only of those inspected. The present form has been adopted of late years.

N.B.—Those aged *over* 13 form, as is shown, only a small proportion; those under 3 are less than 1 per cent. The actual numbers of *six-sevenths* of the total population will best serve for comparison, viz.:—

[In 1,000's.]

Centesimal proportion	3 to 5, Two Years.	5 to 7, Two Years.	Total Infants, Four Years.	7 to 10, Three Years.	10 to 13, Three Years.	Total Elder Children, Six Years.	Total, Ten Years, 3 to 13.
	1,170,	1,123,	2,293,	1,593,	1,490,	3,083,	5,376,
	} 21·75	20·85	42·6	29·65	27·75	57·4	100

TABLE IV.—*Abstract showing Income from Private and Municipal Sources, Amount of Annual Grant, Total Income, and Average Cost of Instruction from 1863 to 1882. (England and Wales.)*

[Numbers from Return (Mr. H. H. Fowler) to House of Commons,
20th March, 1883.]

[000's omitted.]

	Income.					Amount of Grants from Educational Department.	Total Income and Grant.	Centesimal Proportion of Grant to Total Income.	Number of Children in Average Attendance.	Average Cost of Instruction per Child.
	Subscriptions.	School Pence.	Other Sources.	Rates.	Total.					
	£	£	£	£	£	£	£	Per cent.		£ s. d.
1863	254,	292,	129,	—	675,	431,	1,106,	39·0	799,	— 19 10½
'64	278,	318,	127,	—	723,	353,	1,076,	32·9	797,	1 1 7¼
'65	311,	350,	125,	—	786,	378,	1,164,	32·4	848,	1 6 5½
'66	319,	369,	132,	—	820,	389,	1,209,	32·2	863,	1 7 4½
'67	352,	391,	101,	—	844,	411,	1,255,	32·7	912,	1 6 8¼
'68	388,	421,	85,	—	894,	459,	1,353,	33·9	979,	1 5 9¾
'69	397,	456,	72,	—	925,	510,	1,435,	35·5	1,063,	1 5 5
'70	419,	502,	77,	—	998,	563,	1,561,	36·1	1,152,	1 5 5
'71	437,	540,	78,	—	1,055,	640,	1,695,	37·8	1,231,	1 5 6¾
	3,155,	3,639,	926,	—	7,720,	4,154,	11,854,	—	—	—
1872	493,	599,	93,	5,	1,190,	790,	1,980,	39·9	1,336,	1 7 5
'73	540,	688,	105,	61,	1,394,	902,	2,296,	39·3	1,482,	1 10 1¾
'74	603,	814,	115,	136,	1,668,	1,032,	2,700,	38·2	1,679,	1 11 2½
'75	676,	934,	128,	236,	1,974,	1,158,	3,132,	36·9	1,837,	1 12 5¼
'76	752,	1,034,	135,	375,	2,296,	1,317,	3,613,	36·4	1,985,	1 14 8
'77	786,	1,138,	147,	453,	2,524,	1,543,	4,067,	37·9	2,151,	1 15 3½
'78	774,	1,275,	165,	571,	2,785,	1,821,	4,606,	39·5	2,405,	1 15 8¾
'79	754,	1,372,	185,	637,	2,948,	1,982,	4,930,	40·0	2,595,	1 16 5
'80	739,	1,432,	199,	726,	3,096,	2,130,	5,226,	40·8	2,751,	1 16 8¼
'81	729,	1,510,	217,	739,	3,195,	2,248,	5,443,	41·3	2,864,	1 16 10½
'82	725,	1,586,	214,	808,	3,333,	2,393,	5,726,	41·8	3,015,	1 16 8½
	10,726,	16,021,	2,629,	4,747,	34,123,	21,450,	55,573,	—	—	—

Note.—The number of schools inspected in the year 1863 was 5,730, and 7,022 in 1867, but in these evening schools are included: further, see V below.

TABLE V.—Statement showing the Increase of Voluntary and Board Schools; Attendances, &c., therein, under the Influence of the Act of 1870, of Public Elementary Schools under Inspection.

Year ended 31st August, 1870.	Voluntary.		School Board.		Total.		Total of		Percentage of Average Attendance on Number on Register.
	Schools*	Number.	Schools.	Number	Schools*	Depart- ments.*	Average Attend- ance.	On Regis- ters.	
		Average Attend- ance in 1,000.		Average Attend- ance in 1,000.					
		(In 1,000.)							
1870.....	—	—	—	—	8,281	12,061	1,152	1,693	67·5
1872.....	9,772	1,327	82	9	9,854	14,101	1,336	1,969	67·8
'73.....	10,574	1,412	520	70	11,094	15,929	1,482	2,219	66·8
'74.....	11,408	1,541	838	138	12,246	17,646	1,679	2,498	67·2
'75.....	12,081	1,610	1,136	227	13,217	19,245	1,837	2,744	67·0
'76.....	12,677	1,657	1,596	328	14,273	20,782	1,985	2,944	67·4
'77.....	13,105	1,723	2,082	428	15,187	22,033	2,151	3,155	68·2
'78.....	13,611	1,846	2,682	559	16,293	23,618	2,405	3,496	68·8
'79.....	14,027	1,925	3,139	670	17,166	24,890	2,595	3,711	69·9
'80.....	14,181	1,982	3,433	769	17,614	25,601	2,751	3,896	70·6
'81.....	14,370	2,007	3,692	856	18,062	26,376	2,864	4,045	70·8
'82.....	14,421	2,070	3,868	945	18,289	26,779	3,015	4,190	72·0

Since 1872, increase of $8\frac{1}{2}$ per cent. in schools.

„ „ $112\frac{1}{2}$ „ children on registers.

„ „ 125 „ „ in average attendance.

Total population 1871, 22,000,000; in 1881, 26,000,000.

* A "School" is an institution under *one* general management; but there may be one head teacher for boys, girls, and infants (one department); one teacher for boys, one for girls and infants, or one for boys and girls mixed, and one for infants (two departments), or independent teachers for boys, girls, and infants (three departments). The distinction is, therefore, somewhat uncertain and shifting, depending on organisation rather than number. The proportion of "schools" to departments has remained nearly constant at two to nearly three.

TABLE VI.—Statement showing General Results in Public Elementary Schools under Inspection as regards Children over Seven Years of Age, subject to Individual Examination under the Codes of 1871 and following Years.

Year ended 31st August.	Number Qualified by Attend- ance in 1,000.	In- crease on Previous Year.	In- crease on 1872.	Number Presented for Examina- tion, in 1,000.	In- crease on Previous Year.	In- crease since 1872.	Per- centage of "Passes."	Proportion Presented to those Qualified.	Aver- age Passes.
		Per cent.	Per cent.		Per cent.	Per cent.			
1872.....	794	—	—	662	—	—	—	83½	—
'73.....	889	12	—	752	13¾	—	—	84½	81
'74.....	1,013	14	27½	858	14	29¾	81	84¾	80
'75.....	1,142	12¾	44	974	13½	47	80	85	
'76.....	1,282	12¼	61½	1,143	17¼	72¾	79¾	89¼	79¾
'77.....	1,436	12	81	1,353	16¾	101¾	78¼	93	78¼
'78.....	1,661	15¾	109½	1,563	17	136	79½	94	79
'79.....	1,872	12¾	136	1,760	12½	165¾	80		80½
'80.....	2,037	8¾	157	1,904	8	187½	81¼		81¼
'81.....	2,126	4¾	168	1,996	4¾	201½	81¾		81¾
'82.....	2,252	6	184	2,119	6½	220	82¾		82¾

VII.—*Statements Exemplifying the Distribution of Annual Grants only in Aid to Public Elementary Schools under the Several Codes or Schedules, Summarised from Returns of the Official Reports.*

No. 7A. Year ending 31st August, 1870. Report, 1870-71, Appendix, p. 16. *Under the "revised Code."*

		[000's omitted.]
	Total grant	£ 580,
<i>Children over 6—</i>		
Proportion (estimated) of grant for "average attendance"*	Per cent. } 35·5	£ 156,
Individually examined in three R's	64·5	282,
		438,
<i>Infants—</i>		
Proportion of grant made for "average attendance"*		75,
Grant on "inspection"		67,
		142,
		580,

Deductions for infringement of articles, 17,000*l.*, or about 3 per cent. Number of children returned in average attendance, 1,152,000.

No. 7B. Year ending 31st August, 1875. Report, 1875-76, Appendix, Tables 5 and 13. *Under the new Code of 1875:—*

		[000's omitted.]
	Total grant	£ 1,207,
<i>Children over 7—</i>		
Proportion of grant on "average attendance"	Per cent. } 44·9	£ 387,
On individual examination, "three R's," 463 <i>l.</i> }		
„ specific subjects, "Art. 21"	55·1	475,
		862,
	100·0	
<i>Infants—</i>		
Proportion of grant on average attendance		151,
Grant on inspection (Code, Art. B 1)		194,
		345,
		1,207,

Deductions for infringement of articles, 49,000*l.*, or nearly 4 per cent.

	s.	d.
For estimated number of children over 7 years old.....	13	— each
„ infants under „ „	13	5 „

No. 7C. Year ending 31st August, 1882. Report, 1882-83, Tables 6 and 11—

* Evidently only those in separate infant schools are returned as infants. I have assumed on other evidence their number to be 30 per cent. of the whole.

	[000's omitted.]
	£
Total grant	2,408,
	£
To small schools, Art. 19 D	24,
For successful instruction of pupil teachers, 19 E	41,
	— 65,
	<u>2,343,</u>

*Including CLASS examinations, commenced in 1875 and 1875-76—
Children over 7—*

	Per cent.	£
Proportion of grant on average attendance	36.0	642,
On <i>Class</i> examination, "19 C"	18.5	329,
		971,
	54.5	
On individual examination, 3 R's, Art. 19, B 2	43.5	775,
" special subjects, Art. 21	1.9	33,
		808,
	45.4	
		1,779,

Infants—

Proportion of grant on average attendance	258,
On general inspection, 19 B	306,
	— 564,
	<u>2,343,</u>

Deductions amounting in all to 14,700*l.*, or little over three-fifths per cent.

	s.	d.
For 2,151,000 children over 7 in average attendance	16	6½ each
" 864,000 infants under "	13	— 8 " "

N.B.—As to *Codes* referred to see Memorandum I.

VIII.—*Statements showing the General Purposes for which the Total Grant has been Dispensed.*

No. 8A. For the year 1861. *Great Britain.*

[Compiled from Table 1 A, volume of Minutes, 1861-62.]

	1861.	1839-61.	Remarks.
Building, furnishing, apparatus, } &c., elementary and normal } schools	£ 113,000	£ 1,500,000	{ Schools from 1834-39 School houses, 1843 Normal school, 1844
In aid of teaching staff of } elementary schools..... }	441,000	2,761,000	From 1846
Capitation grants	77,000	327,000	" 1853
Normal schools, annual grants.....	102,000	615,000	" 1846
			{ Original, increased in 1846, and as occa- sion required
Inspection	44,000	444,000	
Administration	19,000	141,000	Gradually increasing
Sundry, viz., industrial pauper } night schools, &c., also former } special grants for 11,600 <i>l.</i> } taken over	18,000	148,000	Sundry dates
For all Great Britain	814,000	5,936,000	

No. 8B. For year ending 31st March, 1870. *Great Britain.*

[Compiled from Table I, volume of Minutes 1870-71.]

[000's omitted.]

	1869-70.	1839-70.
Building, furnishing, &c., elementary schools	33,	1,727,*
Augmentation of salaries (continued in Scotland } only).....	91,	4,141,
"Capitation" grants	—	474.†
Annual grants to normal schools	74,	1,336,
" elementary schools	551.‡	2,865,
Administration, including 61,000 <i>l.</i> for inspection ...	88,	1,246,
Sundry (under 1,000 <i>l.</i>)	—	74,
	840,	11,863,

* These grants ceased under the Act of 1870, but about 40,000*l.* was expended subsequently on undertakings previously commenced, making ultimately a

	£
Total from the parliamentary grant of	1,767,000
Which with private contributions	4,866,000
Together	6,633,000

provided 5,742 schools, comprising 9,064 departments, for 1,233,050 children (including 247,982 infants), and 3,499 residences for teachers. *Vide* separate account (2) in report of the Department to 31st December, 1882.

† Discontinued.

‡ Under Revised Code of 1870 including evening schools.

No. 8C. For year ending 31st December, 1882. *England and Wales.*

[Compiled from Table A, Report, 1882-83.]

	£
Annual grants	2,467,000*
" to training colleges.....	110,000
To small board schools (33 and 34 Vict., cap. 75, } sec. 18), 2,500 <i>l.</i>	9,000
For payment of fees to children (Act 39 and 40 } Vict., cap. 79, sec. 18), 6,500 <i>l.</i> †	
To evening schools	13,000
Cost of inspection	138,000
London office and contingencies.....	59,000
Pensions, gratuities, 5,500 <i>l.</i> , and sundries.....	6,000
	2,802,000

* Under codes, see Statements I and VII.

† By Act of 1876, the fees of children obtaining "certificates of proficiency" before 11 are paid by the department for three years.

The total grants since 1839 are given as 33,058,000*l.*, but are not now divided in the reports under the headings formerly given.

STATEMENT IX.

A rough test of the work accomplished by inspected schools receiving an annual grant, viewed in relation to the whole field, is afforded by the following statement. The proportion of *six-sevenths* has been so much used in estimates since 1870 that I retain it. Only children from 7 to 13 (six years) who are subject to personal examination are included in it; but the *proportion* of those qualified, presented, and passing under the standards is necessarily taken from the returns of all children, as ages are inextricably mixed in the examination returns. It refers only to the three "R's:"—

	1882.		1877.		1872.	
	Per-centage as Specified.	Per-centage on Six-sevenths of Total Number of Children.	Per-centage as Specified.	Per-centage on Six-sevenths of Total Number of Children.	Per-centage as Specified.	Per-centage on Six-sevenths of Total Number of Children.
Proportion of children on the registers of schools as above to six-sevenths of total number	—	91·0	—	73·25	—	42·0
Proportion of those qualified for examination by attendances to total on registers *	73·75	67·10	63·4	46·45	66·66	28·0
Proportion of those presented for examination to those thus qualified...	94·0	63·10	92·97	43·2	84·0	23·5
Proportion of those examined who passed completely	65·03	41·0	57·67	24·9	62·0	14·6
Proportion of those examined who passed in two or three subjects	87·48	55·0	82·56	35·65	—	—
Average passes (<i>i.e.</i> , sum of passes in R., W., and A. ÷ 3)	82·8	53·25	78·25	33·75	80·0	18·8
Total number on register, 7 to 13 years old	2,804,000		2,265,000		1,112,000	
<i>Six-sevenths</i> of total population	3,084,000		2,846,000		2,260,000	

* Attendances must all be made in *one* school, which may shut out a few who could pass the examination.

Those also who fail every year in the higher standards must have previously passed the lower, and will not be *wholly* uninstructed, but the "complete passes" on all three subjects are a fair measure of the work satisfactorily accomplished. But of these ultimate passes only 18, 22 $\frac{1}{2}$, and 28 $\frac{1}{4}$ for the three years respectively (instead of over 48 per cent.), were of children presented in Standards IV to VI. See 2E.

STATEMENT X.

TABLE XA.—*Showing the Conditions under which Pauper Children in England and Wales are being Brought up and Educated.*

[Abstracted and compiled chiefly from "Report of Local Government Board, "1881-82. Appendix E," pp. 296—318.]

	Number of Unions.	Population. (000's omitted.)	Number of Children.	Description of School Provision.
1	34	3,000	7,700	{ In eleven district schools (seven metropolitan and four country); also the training ship "Exmouth"
2	32	3,250	6,900	{ In twenty-six separate schools, including the industrial schools at Kirkdale and Swinton, Manchester
3	34	2,750	4,000	{ In schools returned as in "separate buildings" (fourteen with 100 to 300 children, twenty with 17 to 100)
4	32	3,500	4,700	{ In "large" workhouse schools, from 100 up to 300 children. Portsea Island Union School is for three unions, containing 352. Average 155
5	325	9,000	12,600	{ In small workhouse schools, under 100. Some under 20. Average, under 40 children
			35,900	{ = the number specified in the return, and for which over 38,000 <i>l.</i> was paid for teachers, for the year ending Lady-day, 1881, from the Parliamentary grant, including 1,119 <i>l.</i> to the "Exmouth"
6	190	4,500	7,100	{ "Sent out" generally to public elementary schools, and will include some "boarded out." The numbers are not given in the return, but are assumed at the average rate, excluding the district schools
	647	26,000	43,000	{ Total, coming under the supervision of the Local Government Board

Note.—A few unions are returned with "No school." Some send boys, but not girls out to schools. These cases I have had to distribute roughly, but the number of these uncertain items is small, only affecting some 550 children, and twenty-four unions, and does not invalidate the general results shown. Such minor changes are constantly going on. It is in contemplation to erect a district school for unions of the Lincolnshire and Nottinghamshire district, but arrangements have not yet been made for a site. Three Welsh districts, Brigend and Cowbridge (39,000), Neath (52,000), and Swansea (95,000), have established "Cottage Homes." The district school for Kensington and Chelsea (251,000), at Banstead, is also at work, since September, 1880, on this system. It has also been adopted at Marston Green, for Birmingham, at West Ham, and partially at Chorley.

TABLE XB.—General Statement of District and Separate Schools for the Metropolis.

[Compiled chiefly from figures derived from "Report of Local Government Board, 1881-82, Appendix," pp. 320-324.]

Union, Parish, or District to which the School belongs.	Aggregate Population in 1,000.	Parishes Provided for. (Population in 1,000.)	School Situated.	Average Number of Children.	Total Cost per Head per Annum
Kensington and Chelsea District. Ditto New School on the "Cottage Home" system at Banstead.....	251	Kensington (163) Chelsea (88).....	Banstead, 25 wks. Kensington 27 " now closed	451.4 458 447.7	£ s. d. 36 9 1* 25 16 -
Metropolitan Asylum District Ship "Exmouth".....	...	In common for all	Grays	588.8	34 10 2
South Metropolitan District ...	592	Stepney (58) St. Olave's, Southwark (135)... Camberwell (187) Greenwich (131) Woolwich (81).....	Herne Bay..... Sutton.....	112.6 1572.7	31 16 9 19 11 2
Westminster	46	Separate	Tooting	170.6	27 5 11
West London District	474	Fulham (115) Paddington (107)..... St. George's (180) Brentford (102)	Ashford	755.3	24 15 10
St. George's-in-the-East	47	Separate	Plashet	264	24 15 10
North Surrey District	436	Wandsworth and Clapham (210) Lewisham (73) Croydon (119) Richmond (34)	Anerley	844.8	24 8 11
Central London District	246	City of London (51) St. Saviour's, Southwark (195)	Hanwell	1239.3	24 2 11
St. Marylebone	155	Separate	Southall	415.5	23 1 4
Forest Gate District.....	228	Whitechapel (71) Poplar (157).....	Stratford.....	617.3	22 3 10
Brentwood "	313	Hackney (136) Shoreditch (127)	Brentwood	646.5	20 16 2
St. Paneras	236	Separate	Leavesden	570.8	20 14 7
Lambeth.....	254	"	Norwood	583.7	19 17 1
Holborn	152	"	Mitcham	494.7	19 8 11
Islington	283	"	Holloway	370.4	19 8 2
Bethnal Green	127	"	Mitcham and Ley- tonstone.....	422.6	18 17 3
Strand (with St. Giles and St. George's)	79	"	Edmonton	431	17 13 1
Mile End Old Town	106	Separate	Mile End	338.9	15 15 8
			Total	10,437.0	Average £22 14 4

* No conclusions can be drawn in the case of Banstead from the costs of the first half-year only.

Hampstead, population 45,000, which forms part of the metropolitan district, sends its children to various district and other schools, making up the total population of 4,070,000

But this includes the three extra-metropolitan unions (printed in italics) 255,000

The total in the Metropolitan (Census) District being..... 3,815,000

The union of St. Olave's, Southwark, is returned as partly provided for in a temporary school.

	£	s.	d.	per annum	£	s.	d.	nearly per week
Average { Provisions	7	19	9	= 3	1			
{ Necessaries	2	7	5	= -	11			
{ Clothing	2	7	3	= -	11			
{ Other Charges ...	9	19	11	= 3	10			
	22	14	4					

This return does not include loans, interest, or extra receipts, which amount to 34,514*l.* = 3*l.* 2*s.* 9*d.* per head, or 1*s.* 2½*d.* per week. The full total of charges thus comes to very nearly 10*s.* per child.

N.B.—These two Tables X were prepared for a Conference on the Bringing up and Education of Pauper Children, held by the Social Science Association, on the 1st and 2nd March, 1883, and are published in its Sessional Proceedings for 1882-83.

TABLE XI.—*Statement showing the Position of Schools under the Endowed Schools Acts of 1869, 1873, 1874, and 1879, as arranged in Census Divisions. Corrected up to March, 1883.*

Agricultural.	I. Schemes finally Approved and in Force.		II. Schemes Published, but not yet finally Approved.		III. Schools not yet dealt with.		Total.	
	Number of Schools.	Approximate Income.	Number of Schools.	Approximate Income.	Number of Schools.	Approximate Income.	Number of Schools.	Approximate Income.
SOUTH EASTERN DISTRICT.		£		£		£		£
Kent (part)	26	16,070	2	514	7	6,765	35	23,349*
Surrey	7	4,244	—	—	7	2,303	14	6,547
Sussex	5	1,228	—	—	11	3,190	16	4,418
Southampton	11	3,356	1	476	12	1,404	24	5,236
Berks	1	2,337	—	—	13	3,542	14	5,879
(Population, 1881, 2,486,151)	50	27,235	3	990	50	17,204	103	45,429
SOUTH MIDLAND DISTRICT.								
Middlesex	7	3,987	1	396	3	1,049	11	5,432
Herts	11	7,667	1	233	10	741	22	8,641†
Bucks	4	700	—	—	8	1,723	12	2,423
Oxford	7	8,522	1	1,900	17	3,964	25	14,386‡
Northamptonshire ..	7	3,130	—	—	22	3,482	29	6,612
Huntingdon	2	294	—	—	7	1,264	9	1,558
Bedford	3	14,650	1	871	1	16	5	15,537§
Cambridge	10	3,637	1	181	4	917	15	4,735
(Population, 1881, 1,596,041)	51	42,587	5	3,581	72	13,156	128	59,324
EASTERN DISTRICT.								
Norfolk	9	2,100	5	5,050	11	2,596	25	9,746
Suffolk	17	7,530	1	190	13	1,982	31	9,702
Essex	12	7,817	2	500	15	2,496	29	10,813
(Population, 1881, 1,342,923)	38	17,447	8	5,740	39	7,074	85	30,261
SOUTH-WESTERN DISTRICT.								
Wilts	4	402	—	—	12	2,411	16	2,813
Dorset	13	4,166	—	—	3	577	16	4,743
Somerset	10	4,269	—	—	12	1,674	22	5,943
Devon	17	10,069	2	1,502	14	2,575	33	14,146
Corwall	6	789	—	—	10	265	16	1,054
(Population, 1881, 1,838,446)	50	19,695	2	1,502	51	7,502	103	28,699

* 27,500*l.* capital.† 1,200*l.* capital.

‡ Including Hulme charity for exhibitions, &c.

§ Including Harpur's charity 14,000*l.*|| Excluding 3,000*l.* or 4,000*l.* not for educational uses.

TABLE XI *Contd.*—*Position of Schools under the Endowed Schools Acts.*

Agricultural.	I. Schemes finally Approved and in Force.		II. Schemes Published, but not yet finally Approved.		III. Schools not yet dealt with.		Total.	
	Number of Schools.	Approximate Income.	Number of Schools.	Approximate Income.	Number of Schools.	Approximate Income.	Number of Schools.	Approximate Income.
NORTH MIDLAND DISTRICT.		£		£		£		£
Leicester	10	8,360	1	893	11	2,099	22	11,352
Rutland.....	1	4,280	—	—	—	—	1	4,280
Lincoln	24	11,992	5	6,286	19	2,029	48	20,307
Notts	9	4,030	—	—	11	4,458	20	8,488
Derby	11	4,414	—	—	13	1,850	24	6,264
(Population, 1881, 1,637,624)	55	33,076	6	7,179	54	10,436	115	50,691

Summary of Agricultural Districts.

	Counties.	I. Schemes finally Approved and in Force.		II. Schemes Published, but not yet finally Approved.		III. Schools not yet dealt with.		Total.	
		Number of Schools.	Approximate Income.	Number of Schools.	Approximate Income.	Number of Schools.	Approximate Income.	Number of Schools.	Approximate Income.
			£		£		£		£
South Eastern }	5	50	27,235	3	990	50	17,204	103	45,429
South Midland }	9	51	42,587	5	3,581	72	13,156	128	59,324
Eastern	3	38	17,447	8	5,740	39	7,074	85	30,261
South-Western }	5	50	19,695	2	1,502	51	7,502	103	28,699
North Midland }	5	55	33,076	6	7,179	54	10,436	115	50,691
(Pop., 1881, 8,921,185)	—	244	140,040	24	18,992	266	55,372	534	214,404

TABLE XI *Contd.*—*Position of School's under the Endowed Schools Acts.*

	I. Schemes finally Approved and in Force.		II. Schemes Published, but not yet finally Approved.		III. Schools not yet dealt with.		Total.	
	Number of Schools.	Approximate Income.	Number of Schools.	Approximate Income.	Number of Schools.	Approximate Income.	Number of Schools.	Approximate Income.
WEST MIDLAND DISTRICT.		£		£		£		£
Gloucester	20	28,210	—	—	20	4,882	40	33,092
Hereford	5	2,120	—	—	11	1,681	16	3,801
Salop	9	4,313	—	—	10	5,524	19	9,837
Stafford	26	9,184	—	—	11	1,653	37	10,837*
Worcester	14	5,008	1	686	18	8,515	33	14,209
Warwick	17	23,957	3	1,238	22	7,707	42	32,902
(Population, 1881, 3,029,362)	91	72,792	4	1,924	92	29,962	187	104,678
NORTH-WESTERN DISTRICT.								
Cheshire	13	3,962	1	17	15	1,205	29	5,184†
Lancashire	42	14,029	—	—	59	11,631	101	25,660‡
(Population, 1881, 4,107,155)	55	17,991	1	17	74	12,836	130	30,844
YORKSHIRE DISTRICT.								
West Riding.....	49	14,865	—	—	53	17,173	102	32,038
East „	6	1,670	5	1,288	10	3,424	21	6,382§
North „	7	1,093	2	2,033	23	3,638	32	6,764
(Population, 1881, 2,894,527)	62	17,628	7	3,321	86	24,235	155	45,184
NORTHERN DISTRICT.								
Durham	8	2,325	—	—	12	1,949	20	4,274
Northumberland ...	8	3,152	—	—	9	915	17	4,067
Cumberland	8	2,813	1	67	20	674	29	3,554
Westmoreland	13	1,858	3	584	26	1,271	42	3,713
(Population, 1881, 1,624,468)	37	10,148	4	651	67	4,809	108	15,608
MONMOUTH AND WALES DISTRICT.								
Monmouth	4	1,971	—	—	2	3,176	6	5,147
South Wales.....	7	3,897	2	7,685	9	1,622	18	13,204
North „	13	2,794	2	1,329	15	2,631	30	6,754
(Population, 1881, 1,577,018)	24	8,662	4	9,014	26	7,429	54	25,105

* Further some mineral rents.

† And 14,000*l.* capital.‡ And 8,600*l.* buildings.§ And 10,000*l.* capital.|| And 15,000*l.* or 20,000*l.* capital.

TABLE XI *Contd.*—SUMMARY for all ENGLAND and WALES.

Census Districts.	I.		II.		III.		Total.	
	Schemes finally Approved and Enforced.		Schemes Published, but not yet finally Approved.		Endowed Schools not Returned in I and II, nor included in Sec. 3 of 1873, within the General Provisions of Endowed Schools Acts.			
	Number of Schools.	Approxi- mate Income.	Number of Schools	Approxi- mate Income.	Number of Schools.	Approxi- mate Income.	Number of Schools.	Approxi- mate Income.
		£		£		£		£
Agricultural	214	140,040	24	18,992	266	55,372	534	214,404
West Midland ..	91	72,792	4	1,924	92	29,962	187	104,678
North-Western.	55	17,991	1	17	74	12,836	130	30,844
Yorkshire	62	17,628	7	3,321	86	24,235	155	45,184
Northern.....	37	10,148	4	657	67	4,809	108	15,608
Monmouth } and Wales. }	24	8,662	4	9,014	26	7,429	54	25,105
	513	267,260	44	33,919	611	134,643	1,168	435,823
Metropolitan (Populatn, 1881, 3,814,571)	40	84,209	7	64,000*	61	28,316	108	176,525
Grand total....	553	351,470	51	97,919	672	162,959	1,276	612,348

* Including 56,000*l.* Christ's Hospital.

Note.—The schools in Col. III do not include 1,725 small schools (not being grammar schools) with an aggregate (approximate) income of 48,966*l.*, which come under the application of sec. 75 of the Elementary Education Act of 1870.

Alphabetical Index to Counties in Census Districts for reference to Table XI.

I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.
London.	South-Eastern.	South Midland.	Eastern.	South Western.	West Midland.	North Midland.	North Western.	Yorkshire.	North-ern.	Wales.
Metropolis		—	—	—	—	—	—	—	—	—
	Berkshire	Bedfordshire	—	—	—	—	—	—	—	—
	Buckinghamshire	—	—	—	—	—	—	—	—	—
	Cambridgeshire	—	—	—	—	—	—	—	—	—
				Cornwall	—	—	Cheshire	—	—	—
				Devonshire	—	Derbyshire	—	—	Cumberland	—
				Dorsetshire	—	—	—	—	—	—
		Essex	—	—	—	—	—	—	Durham	—
Hampshire	—	—	—	—	Gloucestershire	—	—	—	—	—
					Herefordshire	—	—	—	—	—
	Hertfordshire	—	—	—	—	—	—	—	—	—
Kent	Huntingdonshire	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	Lancashire	—	—	—
						Leicestershire	—	—	—	—
	Middlesex	—	—	—	—	Lincolnshire	—	—	—	—
								—	—	Monmouthshire
	Norfolk	—	—	—	—	—	—	—	—	—
	Northamptonshire	—	—	—	—	—	—	—	—	—
						Nottingham	—	—	Northumberland	—
	Oxford	—	—	—	—	Rutland	—	—	—	—
					Shropshire	—	—	—	—	—
				Somersetshire	—	—	—	—	—	—
		Suffolk	—	—	Staffordshire	—	—	—	—	—
Surrey	—	—	—	—	—	—	—	—	—	—
Sussex	—	—	—	—	—	—	—	—	—	—
					Warwickshire	—	—	—	—	—
				Wiltshire	—	—	—	—	Westmoreland	—
				Worcestershire	—	—	—	—	—	—
								West Riding	—	—
								East „	—	—
								North „	—	—
									North Wales	—
									South „	—
1	5	8	3	5	6	5	2	3	4	3 Counties
I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI. Districts

MEMORANDUM XII.—*Referred to in Sec. 24 and Sec. 30.*

The present State of the Law as regards (a) Total or Partial Exemption from School Attendance; or (b) The Employment of Children, stands generally thus:—

I. Under 10 years of age: no child can have exemption from school attendance on the ground of employment in regular labour, nor may be so employed.

II. Over 10 years of age:—

A. Between the ages of 10 and 13 attendance in whole or in part depends upon local bye-laws framed, whether by school boards or school attendance committees, under the provisions of the Act of 1870, extended by those of 1873 and 1880. These Acts deal only with these ages. The then existing powers of school boards to make bye-laws were incorporated in the Act of 1876, and extended to school attendance committees in those districts where school boards had not been formed. All bye-laws require the sanction of the Education Department, and their conditions must not be less stringent than those stated below.

B. Employment in *factories and workshops* up to the age of 14 is regulated by the Consolidated Act of 1878, 41 and 42 Vict., cap. 16. That of children in *mines* by Acts of 1872 (35 and 36 Vict., cap. 76, *coal*, &c.) and of 1872 and 1875 (35 and 36 Vict., cap. 77, and 38 and 39 Vict., cap. 39, *metals*), which comprise educational clauses. Practically, however, children, both in *mines* as well as in *factories and workshops*, now come under local bye-laws as regards school matters, and a certificate authorised by the Education Department of “proficiency” or “due attendance” is required to exempt a child either (a) partially, or (b) totally from further school attendance.

C. In cases not so regulated, or where these Acts do not apply the *general provisions* of the Elementary Education Act of 1876 require that no child between 10 and 14 shall be employed (and consequently exempt from school attendance)

who has not satisfied one or other of the following conditions, viz.:—

(a.) Passed the fourth standard. (Certificate of proficiency.)

(b.) Attended not less than 250 times in not more than two certified efficient schools during each year, since the age of 5, for five years, whether consecutive or not. (Certificate of due attendance.)

This covers the case of children between 13 and 14. It appears therefore that a child who has attended with this moderate degree of punctuality for five years from the age of 5 has a legal right to exemption, unless coming under the Factory and Workshops' Act, the Mines' Acts, or local bye-laws.

"Dunces' certificates," or those given for attendances only, are, however, not often claimed.

Partial exemption ("half time") under bye-laws depends, *inter alia*, upon "beneficial and necessary employment"—mere exemption from school attendance without such cause is disallowed.

The *usual* standard for partial exemption (half time) under bye-laws is the third, and for total exemption, the fifth. These "certificates of proficiency" require passes in *all three* subjects, and differ thus from the ordinary school pass of two only out of the "three R's," which does not imply more than that the pupil goes on to the next higher standard in the school.

The cause of these discrepancies is that the *employment* of children has been dealt with directly from an early period by many Acts which touched only incidentally on education. Later and more adequate regulations arising under the *Education Acts* and dealing specially with *school requirements* are now in course of extension throughout the country.

TABLE XIII—*Code of the Education Department for 1881, controlling the Distribution of the Annual Grants to Public Elementary Schools till 31st March, 1883.*

STANDARDS OF EXAMINATION.

28.	Standard I.	Standard II.	Standard III.	Standard IV.	Standard V.	Standard VI.
Reading*	To read a short paragraph from a book, not confined to words of one syllable	To read a short paragraph from an elementary reading book	To read a short paragraph from a more advanced reading book	To read a few lines of prose or poetry selected by the inspector	Improved reading	Improved reading
Writing	Copy in manuscript character a line of print, on slates or in copy books, at choice of managers; and write from dictation a few common words	A sentence from the same book, slowly read once, and then dictated Copy books (large or half-text) to be shown	A sentence slowly read out once, and then dictated from the same book Copy books to be shown (small hand, capital letters, and figures)	Eight lines slowly read out once, and then dictated from a reading book Copy books to be shown (improved small hand)	Writing from memory the substance of a short story read out twice; spelling, grammar, and handwriting to be considered	A short theme or letter; the composition, spelling, grammar, and handwriting to be considered
Arithmetic†	Notation and numeration up to 1,000. Simple addition and subtraction of numbers of not more than four figures, and the multiplication table, to 6 times 12	Notation and numeration up to 100,000. The four simple rules to short division (inclusive)	Notation and numeration up to 1,000,000. Long division and compound addition and subtraction (money)	Compound rules (money) and reduction (common weights and measures)‡	Practice, bills of parcels, and simple proportion	Proportion, vulgar and decimal fractions
Grammar	—	(1) <i>To point out the nouns and verbs in the passages read or written</i>	(1) <i>To point out the nouns, verbs, adjectives, adverbs, and personal pronouns</i>	(1) <i>Parsing of a simple sentence</i>	(1) <i>Parsing with analysis of a "simple" sentence</i>	(1) <i>Parsing and analysis of a short "complex" sentence</i>

N.B.—As to the words printed in *italics*, see Article 19 C 2. For other class subjects (to be arranged with the inspector) see Article 19 C 1.

* Reading, after Standard I, will be held to include intelligence and fluency increasing with each standard. It will be tested in the ordinary class books, if approved by the inspector; but these books must be of reasonable length and difficulty, and unmarked. If they are not so, books brought by the inspector will be used. Every class ought to have two or three sets of reading books. The class examination (Article 19 C) will be conducted so as to show the intelligence, and not the mere memory of the scholars.

† The work of girls will be judged more leniently than that of boys; and the inspector may examine scholars in the work of any standard lower than that in which they are presented; and in mental arithmetic suitable to their respective standards.

‡ The "weights and measures" taught in public elementary schools should be only such as are really useful:—such as avoirdupois weight, long measure, liquid measure, time table, square and cubical measures, and any measure which is connected with the industrial occupations of the district.

DISCUSSION *on* Mr. HAMILTON'S PAPER.

MR. F. S. POWELL said that when he contrasted the state and conduct of the working classes in Lancashire and Yorkshire, when he was a boy, with their condition and behaviour now, he felt that the efforts of educationalists had not been in vain. The work of education could not progress by itself. The working man's child could not be properly taught when he was living in a miserable dwelling; the child could not be advanced while the parent was lost in the degradation of intemperance; but when sanitary reform and temperance were progressing in every town, it was difficult not to feel confidence in the bright prospect of the future. There were two great agencies in operation in the North of England. One was the Mechanic's Institution, which had a most beneficial influence on the habits, the minds, and the culture of the working classes. There was also the Church Institution, which worked on somewhat different lines, but aimed at the same results. The members of the Church Institution in Bradford had on more than one occasion obtained from South Kensington the highest honours in art. Sunday schools also exercised an influence in a similar direction. It was no small matter to collect together Sunday after Sunday, and to teach habits of regularity and order to the boys and girls who passed their week days in factories. But were they quite sure that they were not pressing the minds of young children too much? He had heard painstaking and devoted teachers express that view, and therefore the friends of education ought to consider whether in their desire to advance the cause, they were not in some degree pushing the infant mind too early and too fast. In a country like England, where the population was so dense and so rapidly increasing, it was a source of great stability to the social fabric that every working man should feel that his child had a chance, and that he might progress from the elementary school up to the secondary school, and even to the university itself. This was a question not only of education, but of politics and of national security. Mr. Hamilton had spoken of the system of 1862 as "degrading." It was thought that the revised code of that year was too mechanical, and that the requirements were not sufficiently adapted to the varying circumstances of the case, and the diverse opportunities of the teachers. By the revised code of 1882-83 that point had been settled in favour of those doubts, and the inspectors were now taught to have regard to the difficulties of the school arising from the neighbourhood when assigning grants. He hoped that this increased elasticity might be found to work well. Nothing could be more depressing to an industrious teacher in a neighbourhood where the children had been neglected, and where the parents were intellectually apathetic, than to know that a higher reward was given to another teacher a few miles off, where there was great intellectual activity in all the homes of the parish. He thought the time had come when there

should be another Royal Commission to make a searching inquiry into the whole question. They knew pretty well what was under the eye of the department, and something, but not sufficient, about the schools which had been reformed by the endowed and the charity commission, but so far as he knew there were no data sufficiently sure and full as to the real wants of the whole country. The wants of the highest class were met by the old and the new schools, and those of the working class by the Education Act; what was being done for the great intermediate middle class? There was considerable obscurity as to what was being done, and it would be of great service to the cause of education if a commission of carefully selected men of large views and of habits of application and industry, were constituted and directed to inquire in the most searching manner into the whole matter, and lay the result of their investigation before Parliament.

Professor LEONE LEVI said the nation was greatly indebted to Mr. Forster for his Act of 1870, which was a practical recognition of the fact that popular education was an important factor in the advancement of society. That recognition came not a moment too soon, because other nations were more in advance than this country. Germany had had for a very long time a system of popular education which left nothing to be desired, and almost every German could read and write years before the English Education Act of 1870. In America the Common School system had been general for a very considerable time, and of late years great progress had been made in education throughout the continent. For instance, the power to sign the marriage register, although it was but an imperfect standard of the state of education, had increased very largely everywhere. In this country, from 1870-80, the decrease in the number of those unable to sign the register had been from 23·60 per 100 to 16·29, or an increase in the power of writing of 31 per cent.; in France it had decreased in the number signing by marks from 33·21 in 1870, to 21·52 in 1879, so that the increase of knowledge there in the period had been 35 per cent. Other countries were therefore advancing very rapidly in the cause of education, and it was high time that England should bestir herself likewise. The points upon which difference of opinion existed as regards the operations of the Education Act in this country, were that the present system was too costly; that we attempted to teach too much; that the poorest and lowest of the population were not really reached; and that there was danger lest that voluntary system might be injured, if not altogether beaten out of the field, by the introduction of board schools. He could not profess to answer these complaints; but, in his opinion, no objection could be urged to the State appropriating some 3,000,000*l.* a year to the cause of popular education, when the national expenditure was 85,000,000*l.* a year. It was a productive investment, and whatever the amount might be, it was a good expenditure. Fault could only be found if there was waste or extravagance, or if the schools were inefficient; but of that there was no danger, for the Privy Council watched over the working of

all the schools. As regards the objection that too much was taught in the schools, there certainly was a danger lest the schools aimed at too high a kind of teaching; but as a matter of fact the great mass of the children did not attain to even the second and third standards, and seldom went beyond the A B C of reading, writing, and arithmetic, so that the bulk of the expenditure was still for elementary education. At the same time he was certainly of opinion that the State, as the State, should not go beyond providing for elementary education. He wished that a little more of manners and morals were taught in the schools. It was a sad fact that the poorest were not met in the national scheme of education. There was still a large number of waifs and strays in the streets, and the demand everywhere was, "Do not stop the ragged schools, because the board schools do not meet that class." Yet the real object of the Act of 1870 was to meet the wants of that particular class. It was very gratifying to find from the tables supplied by Mr. Hamilton, that the voluntary schools had not been driven out of the field. Whereas in 1872 there were 9,700 voluntary schools, in 1882 there were 14,400. The history of popular education in Great Britain was very fully brought before the Society, and the tables which illustrated the working of the present law would be found of considerable value to educationalists, and he united in offering his best thanks to Mr. Hamilton for his valuable contribution.

Mr. F. ATTERBURY expressed his regret that Mr. Hamilton had not been able to refer to the effect of education upon juvenile crime. When the Education Acts were under discussion, it was a strong argument in their favour that popular education would diminish crime; but having recently had occasion to look into the judicial statistics, he was afraid there was no very good ground for that contention. Comparing the period from 1871-76 with the period from 1876-81, it would be found that there had been an increase rather than a decrease in crime. Of heavy—indictable—offences there was an increase of between 4 and 5 per cent., and of minor offences a greater increase. Taking the number of persons committed to prison, there was also a large increase in the last five years. It was true there was a decrease in the number of young criminals sent to prison during that time, but the number of petty larcenies had rather increased than diminished. But it was as regards reformatories that the statistics were most instructive. Here a curious movement was shown. In the number of those committed there had been a slight increase, but their ages had risen, and on admission they were found to be better educated. So in the case of industrial schools, which were partially used for confining young criminals, the movement was towards older boys. Perhaps it was as yet too early to form a judgment on the effect of the Act of 1870 on crime, but the figures at present obtainable, especially those relating to reformatories and industrial schools, pointed towards an increase in educated juvenile criminals. The conclusion he drew was that it was not sufficient merely to educate the children, but that it was desirable that they should be assisted

to obtain an honest livelihood. Prisoners on discharge were looked after by the Discharged Prisoners' Aid Society, and emigrants, on landing abroad, by the emigration agents; but when boys had been educated up to a certain point, they were turned out into the world without help or advice, and so probably assisted to prove that "a little knowledge is a dangerous thing."

Hon. EDWARD ATKINSON, of Boston, Massachusetts, said that in America the central government might be said to have little or nothing to do with education; with this exception, that a grant of public lands had been made to the several States in proportion to their population, for endowing schools for mechanic and agricultural instruction. It had, however, been proposed to make a permanent application of the proceeds of public lands in the proportion of illiteracy. But that would be far from a right standard, for although the common school had been the natural outcome of local self government, and of the New England town meeting, yet in the eastern States there was quite a large proportion of illiteracy as compared with the middle and some of the western States. That arose from the fact that the eastern States absorbed the poor of all lands. In the last three years 2,000,000 of these had arrived in America; and a considerable proportion of them remained in the eastern States in the factories and workshops, doing harder work than any Yankee was willing to do. One-fourth of the population of Massachusetts were foreign born. Therefore if the standard of illiteracy were established, New England might get more than its share of the public lands. By the laws of the State there must be certain schools in each town, and in towns of a certain population a high school must be added, and the common school must be free to all. The education given there went far beyond the standard set down by Professor Leone Levi, and fitted the boys and girls for any higher instruction they chose to seek. He did not agree with those who were in favour of stopping short of a complete education for those who were willing to subject themselves to it; but in some measure perhaps the matter had been carried beyond what was prudent and right. The cramming system had gone too far. Many pupils had been unfitted for the work of a lower kind which the necessities of their position compelled them to follow. The training of the hand had been neglected, while the so called training of the mind or head had been pushed too far. The great effort now was to find out how to train the one universal tool, the human hand, not to teach a trade, but so to train each boy or girl that they may be able to apply their hand to any trade for which they might be fitted. Strangely enough, one of the most valuable results of the Great Exhibition in Philadelphia in 1876, was to bring from Russia a right and inexpensive method of teaching the mechanic arts. Upon the basis of that method a school, appurtenant to the other schools of the Massachusetts Institute of Technology, was established for instruction in carpentry and metal working. No attempt was made to teach a trade, but by the conversion of a bit of wood or iron into various forms to train the hand. This mechanic art instruction had also been incorporated as a necessary part of the instruction of

the civil engineer, the architect, &c., and it afforded an exceedingly valuable variety or change of function. This plan had been adopted in St. Louis, Washington University, and the Hampton Institute for the education of Blacks and Indians in Virginia. In the Puritan days in New England, legislation for the town, the parish, and the school, was conducted at the same town meeting. Each parish now constitutes a civil corporation. In the town where he resided there were about 8,000 inhabitants, and in the town meeting, where every man who paid the poll tax had a right to vote, \$40,000 a year were contributed to the common schools, or about 1*l.* each. There were some 1,200 or 1,500 pupils in the schools, and the high school fitted them for the university or the technical school. The schools were governed locally, and there would be great objection to any interference by the State except in the direction of compelling them to have schools. Upon the school committee of his town there were one Episcopalian clergyman, one Unitarian, one Swedenborgian, one Congregationalist, and one Catholic. All joined in the support of the common school, whatever their religious difference might be. It was the solvent of race, creed, and condition, and without it the State could not be safe. It was the outgrowth of local self-government, and would exist as long as that existed.

Hon. E. LYULPH STANLEY, M.P., wished to make a few remarks on the growth of the education of the country since the passing of the Act of 1870, and the probable future development of it. The more familiar they were with the work of the present day, and the more they appreciated what might be done, the more they would feel that they were only on the threshold of elementary education. He agreed with Mr. Atkinson, that in order to have a popular, attractive system of education throughout, the sympathy and control of the people in their several localities must be enlisted. Professor Leone Levi had questioned whether the present system was not too costly; and undoubtedly it was costly compared with what people were accustomed to think was the normal course of the education of the poor. Everyone was familiar with the calculation of 30*s.* for each child—10*s.* grant, 10*s.* fee, and 10*s.* voluntary contributions. Though no doubt the yearly cost of maintenance of each child in the voluntary schools had only grown to about 35*s.*, the expenditure in the board schools had increased, and very likely would continue to do so. But when they talked of the cost, the question was, what did they want to buy for their money? If they measured the cost by the class of article they wanted to turn out, it would be seen that education was starved and kept down with a view to diminish the cost. The principal cost was that of teaching. If a large school were built for 1,000 or 1,200 children, at 8*l.* a place, that would represent a minimum cost; but if the general corridor arrangements were improved, and the elevation were treated so as not to resemble a warehouse, the cost might be increased to 10*l.* or 11*l.* a head. If 100,000 places had to be added in London, that would make a difference possibly of 300,000*l.* The schools were built with borrowed money, at about 4 or 4½ per cent., and principal and interest were to be wiped out in fifty years. Therefore the difference between building the

schools in a proper way and in a starved way would be about 13,000*l.* a-year, which was a burden on the rates of less than one-eighth of a penny in the pound. That showed that it was not the buildings that caused the expense. The rule of the education department was that the minimum staff was one certificated teacher for 80 children in average attendance, which meant in most schools 100 children on the rolls. The rule of the London School Board was one certificated teacher to each 60 scholars in average attendance. That was equivalent to 75 or 80 children passing under his control during the week, and in the poorest neighbourhoods, 85. The expense was therefore kept down by giving to each teacher a larger number of scholars than he ought to be expected to teach. In France the number was 1 to 50, in Holland, 1 to 40. Economy was also practised at the expense of efficiency in the matter of the pupil teacher system. No doubt that system had its good side, if the pupil teacher was really regarded as an apprentice pursuing his studies while watching the methods of teaching; but when he was made responsible for the instruction of a class, economy was obtained at the expense of efficiency; but if London were taxed at the same rate as the town in Massachusetts to which Mr. Atkinson had referred, the total cost, including grants and fees, would be close upon 4,000,000*l.* He believed Paris was spending something like 6*l.* a-year on each child it educated, though the salaries were considerably lower than in England; but the ideal that the French had set before themselves of what was due to the rising generation was very much in advance of the English ideal. If the education of the community was to be seriously dealt with, no diminution, but rather an increase, of expenditure must be contemplated. The second objection raised to the present system was, that it was too ambitious; but Mr. Leone Levi had answered that when he pointed out that the education was extremely elementary. The proportion of children in the higher standards was still extremely low, and in fact the work of education in London was at present the work of pioneers. It was scarcely true to say that the poorest were not reached. The disreputable were not. Many people were of opinion that the School Board in London had been over building, and from 1879 to 1882 they had added 50,000 school places, while the voluntarily supply had been practically stationary. It might be thought that that addition would have made some mark on the population, and have done something to overtake the deficiency; but it had only to a slight extent altered the percentage. When the school places were 50,000 fewer than now, they were about 76 per cent. compared with the number of children scheduled as demanding places, and now the percentage was only 78. The proper proportion ought at the very least to be 88 or 89 per cent. Of course where the school provision still lagged so far behind the needs of the population, those who wished to get in would rush in, while those who were reluctant to get in would stop out, and by the time compulsion was applied every place was filled by the respectable class. He was quite satisfied that the only way to get children into the schools was to provide plenty of good places and good teaching. He did not attach more than the most trifling

value to compulsion. At the beginning of the work it was said there were 95,000 vacant school places. What could seem more plausible than to say, "try and fill those before you build?" But as a matter of fact they had gone on building till now they had got 250,000 school places, and they were full, while some of the voluntary schools were still only half full. He did not think that at present public opinion in England was ripe for free schools. So long as there were two systems, free schools could not easily be established, because they would deal a death blow to the voluntary system. When last he made inquiries into the schools of Boston, he found that though they were free, the children were charged for the books, stationery, &c. He thought it was certain that within a few years voluntary schools in London would go to the wall, except in very wealthy parishes. Anyone who walked through Bethnal Green, Whitechapel, or Walworth, would see that it was perfectly impossible that in those districts denominational schools could last much longer. The buildings were old-fashioned and quite inadequate, while if repairs were needed, the money could not be raised. In the rural districts no doubt the voluntary schools would last much longer; but if they were to have a system of instruction worthy of calling a system, they must fall back on the large purse of the general ratepayer, which was the only purse able to meet the demands which the future would make.

Mr. E. W. ATKINSON said that in Sweden instruction in carpentry was part of the common school system, and private schools were being compelled to adopt it.

Mr. DAVID ROSS, Q.C. (of Dublin), said the highest class and the lowest class were amply provided for, but the respectable middle class were in many districts sadly in want of the means of getting a thoroughly good education. The commission which Mr. Powell had recommended, could not be too soon appointed to inquire into the best means of organising a thorough system of intermediate education in every town or district. An immense amount of time was misspent in learning the more advanced parts of arithmetic by children who had no natural capacity for it, and who must labour with their hands. It would be much better if the time so practically wasted were spent in learning thoroughly the arts of reading and writing, and how to use common tools. If young people were solely trained in mere literary school work, it was not unlikely that an increased number would betake themselves to criminal courses, through inability to earn the means of living. The teaching of religion was provided at the public expense for all classes, without causing a feeling of degradation in any, and he did not see why secular education should not be provided for every class of the community with a like effect.

Mr. W. H. GREENING (Member of the Birmingham School Board) said he was rather struck with Mr. Atterbury's figures about the increase of crime, but would ask was not something of this stated increase due to the increased vigilance with which

children were now looked after? He asked, was not a great deal due to the fact that religious instruction was ignored in some board schools? Mr. Powell had expressed a fear lest young minds should be pressed too much, but in Birmingham no difficulty had arisen, although the board had been giving a considerable amount of scientific instruction. Some were at first fearful with regard to the expense of giving such instruction, and next as to its effect upon the more elementary part of the education given; but he was glad to be able to say that it had paid, and that the elementary subjects had in no way suffered, but were passed better than ever. The scientific instruction was rather looked upon by the children in the light of a kind of recreation. With regard to the question of free education, seeing that the upper middle classes bore such a large amount of the taxation, if education was made free it should be free to all. The importance of higher education could not be over estimated, but in Birmingham there is now a complete system of lower, intermediate, and higher education, and he hoped some means would be found for largely developing a similar system throughout the country.

Rev. T. D. C. MORSE said the deficiencies of the present system of popular education were found both in the case of the children who were not yet got into school, and in the amount of the education given to those who attended. There were 1 million children in the country whose names did not appear on the school registers. In London alone there must be 120,000 not yet in regular attendance at school. It was a social problem how to get the lowest classes under the civilising and humanising influences of education. In the speeches that were made at the time the Education Bill was passing, there was nothing whatever to indicate that the object aimed at was simply to educate the waifs and strays of the community. Mr. Forster distinctly stated that his object was "to fill up gaps." With reference to the remarks made about over-education, a year ago there were in the London board schools 291,711 children on the roll. Of those, 27.9 per cent. were below Standard I; 21.7 per cent. were in Standard I; 16.3 per cent. in Standard II; 13.7 per cent. in Standard III; 10.6 per cent. in Standard IV; 6.4 per cent. in Standard V; and 2.8 per cent. in Standard VI, and beyond Standard VI, 6.0. In the presence of such facts as these, was there any special danger of the children at the present time being over-educated?

The PRESIDENT, in proposing a vote of thanks to Mr. Hamilton for his able paper, referred to the apparent increase of crime which had been alluded to by some of the speakers. They must not, he said, run away with first impressions. Increased vigilance must be taken into account, and the increase of the population. It must also be remembered that crime had some relation to the state of trade. The last five years had been years of very poor trade compared with the previous five, and whenever there was a great depression in trade there was for the time an increase in crime. It was quite too soon as yet to say that the increase was anything

more than the ordinary fluctuation due to the depressed state of trade.

Mr. ROWLAND HAMILTON, in reply, said that the impression he had wished to convey was, that while the work hitherto done had been the result of very many agencies, and was in some respects worthy of all praise, yet still a great deal remained to be done, and the success of the past was no measure of what ought to be attained in future years. Table IX showed that while there were 91 per cent. of children between the ages of 7 and 13 on the registers, very little more than 67 per cent. made attendances which justified the conclusion that they were in a position to obtain a fair knowledge of the rudiments of education; and in 1877 the proportion of children of these ages was less than one-half, although the attendances required to qualify such children for examination were six only in a school opened, morning and afternoon, for five days in the week. Mr. L. Stanley's remarks as to the large numbers under each teacher were specially valuable. The great object in dealing with these large masses, was to endeavour to diminish the number of stragglers who did not keep pace with the march of civilisation, and it is these weakly ones who especially need the teacher's care. Mr. Atkinson's observations with regard to the training of the eye and hand, and the development of the whole of the faculties, would meet with a full response from all who were engaged in the work of education in England. It had become a standard principle to endeavour to follow the order of nature, and cultivate the perceptive faculties at the earlier ages of childhood. He could not agree with the way in which the plea of cost had been put forward. A great portion of the increased cost was due to the teaching, and good teaching was all essential; it was the one thing in which they could not afford to economise. He quite agreed with Mr. Powell that there was work for a royal commission, not only because the reports now ran only in the groove of the State aided schools, and took no cognisance of neglected districts, but also because of the question of intermediate and middle class schools urgently required to be dealt with as a whole. With regard to overwork, the evil was a very serious one, which should by no means be ignored, but he was fully convinced that the root was very often owing to bad grounding in the earlier stages. If anyone of mature age was put in the position of having to carry out some work for which he was ill prepared, he would find that the strain on his mental faculties was beyond all comparison greater than if he had previously mastered the preliminary knowledge required. Still more must this be the case with children. If the system worked more perfectly, if children always went on from class to class in the same school, to check the bad teaching in the lower standards would be easy enough; but the frequent changes of children from one school to another, and of teachers themselves, made it very difficult to detect such shortcomings, and until a more efficient check than that of careful individual examination could be devised, that system must be maintained as a prominent feature in our administration.

MISCELLANEA.

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I.—*Dr. William Farr, C.B., D.C.L., &c.*

At a meeting of the Council of the Statistical Society, held 17th May, 1883, Arthur H. Bailey, Esq., F.I.A., one of the Vice-Presidents of the Society, in the Chair.

Resolved—"That the Council desire to record on its minutes the deep regret which is felt by the whole body of the Statistical Society at the death of—

DR. WILLIAM FARR, C.B., D.C.L., &c.,

whose services extended over a period of forty-four years, he having been elected a Fellow in 1839, and served as a Member of the Council from 1840 to 1882, with the exception of one year (1847); he further served as Treasurer from 1855 to 1867; as Vice-President from 1867 to 1870; and as President for the years 1871-72 and 1872-73.

"Dr. Farr was a liberal Donor to the Library, having contributed to it in the years 1836, 1837, 1839, 1840, 1841, 1842, 1843, 1855, 1856, 1857, 1858, 1861, 1865, 1867, 1868, 1870, 1871, 1872, 1873, 1877, 1878, and 1879.

"He read numerous Papers before the Society, viz., in the years 1841, 1846, 1849, 1852, 1853, 1857, 1861, 1864, 1865, 1866, 1871, 1872, 1876, and 1877, some of them being of exceptional value; and he gave further evidence of his strong interest in the welfare of the Society by proposing and seconding the candidatures of no less than two hundred and sixteen Fellows."

The following letter is communicated to the Fellows of the Society through the *Journal*, by desire of the Council. It is from Dr. Edward Jarvis, ex-President of the American Statistical Association.

"BOSTON, MASSACHUSETTS,

"April 30th, 1883.

"*To the Statistical Society of London.*

"We have with great sorrow read the account of the death of our friend and corresponding member William Farr, M.D., D.C.L., F.R.S., of London.

"We were aware that he had for a long time been in failing health, and was therefore compelled to suspend his official and important labours at the English registry office.

"In that office he had been from the beginning the chief organiser and master spirit, and to him the world is indebted for the more than forty volumes of Annual Reports of Births, Marriages, and Deaths, and that great work the English Life Table. These works on vital statistics are full of wisdom and instruction, such as few in any country or any age have ever produced.

"Dr. Farr was an accomplished mathematician; he was familiar with the laws of population and of mortality and of health; he was indefatigable in his labors for the physical wellbeing of the people, and his instructions have been plentiful and rich, and of invaluable service to his own country and to the whole civilised world.

"He was one of the leading spirits of the London Statistical Society, sometime its President, and a frequent and very valuable contributor to its *Journal*.

"He was the principal manager of the Health Section of the Association for the Advancement of Social Science, and in manifold ways he gave his ever willing and powerful aid to the strengthening and elevation of mankind.

"In this great loss the American Statistical Association suffers in common with the London Statistical Society, and offers its tenderest sympathy and regret.

"For the Association,

"EDWARD JARVIS."

II.—*Review of the General Results of Demography applied to Political Economy.* By E. Levasseur. (Translated from the "*Journal de la Société de Statistique de Paris*," March, 1883.)

THE principle of population in its moral and political effects, and in its practical operation upon the condition and interests of mankind, cannot fail to be a question deeply interesting to all economists, man being the very mainspring of the whole economic movement. It is he who is the producer and the consumer. In a country densely populated, and in which all members of the community are able to work, and are more or less employed in useful

labour, a considerable store of wealth is created ; but in a country with an abundant population, there must of necessity be a large consumption of wealth to furnish the means of subsistence. Therefore it will be evident that a certain relation must exist between the three terms, population, production, and consumption.

If each person were capable of producing yearly, the exact quantity of food, and the various articles necessary for his subsistence and accommodation which he annually consumes, then the question of the increase or decrease of the population would be a comparatively unimportant one, as the balance of annual produce and consumption being maintained, the conditions of mankind would be uniform and unchangeable. Such, however, it is well known, can never be the case, as members of all classes of the community produce either in a greater or less degree, according to their individual capacity, the amount of capital they possess, and the progress of civilisation and the arts. Again, in the consideration of this question of population, we must not lose sight of the fact that food supplies, which take the first place among the productions necessary to sustain life, are derived from the cultivation of the earth, which is of limited extent ; it follows therefore that the land constitutes another factor which must be taken into account. Then as regards the consumption of wealth, it is well known that all men in the same station of life do not consume the same amount, the consumption being materially affected among other causes, by disparities of fortune. To illustrate our meaning, let us take the number 100 as representing the wealth of a country, and assume that it could not be exceeded ; if ten persons between them dispose of fifty parts of this whole number, it is evident that the country could not support as many inhabitants, or in the event of it being able to do so, the conditions of life could not be so favourable as they would be were each person to consume his unit. In the latter case 100 units would maintain 100 persons ; whereas in the former, supposing the unit to represent the minimum necessary to support existence, the country would be unable to provide for the wants of more than 60. The distribution of wealth, therefore, constitutes another element which must be taken into consideration, and one which has considerable bearing upon the question of population. There can be no doubt that the principle of population is one of the most important in the whole science of political economy, as riches being created for the purpose of sustaining the life of man and securing his comfort and well being, the condition of the population may be considered the very keystone of the economical organisation of society. It is also a very complex question, and has become the subject of a special science termed Demography, which relies upon statistics for the verification of the conclusions deduced by it.

Before touching upon those facts most nearly affecting political economy, which have been brought to light by the study of this science, it may not be out of place here to call attention to the more general principles regulating the balance of population and wealth. They may be briefly stated as follows :—*When both production and capital increase, the tendency of the population is to increase also.*

When the average individual consumption increases, the tendency

of the population is to increase in a slower degree, or to remain stationary.

When the most fertile lands have been long under tillage, and have become deteriorated, and when the fruits of the soil are extracted with increased difficulty, the expansion of the population becomes more restricted.

When the distribution of riches becomes more evenly proportioned, then the growth of the population will be facilitated.

These principles, which among many others have been clearly set forth by M. Courcelle-Seneuil, in his excellent treatise on political economy, must necessarily admit of exceptions, and are liable to undergo considerable modification.

The multiplication of the human species, as well as of inferior animals, is regulated by physiological laws which apply equally to mankind and to all created beings. These laws are to a certain extent modified by social conditions, and as it is impossible to obtain reliable data for other than civilised countries, the numerical results of demography can only be shown for those places which have been brought under the influence of civilisation.

If we look at the returns of births, we find that the birth-rate, that is, the annual proportion of births to the population which supplies these births, is subject to considerable variation. For example, in Russia it is at the rate of 50 for every 1,000 of the population, while in Rhode Island it amounts to only 20. The annual average may be taken at 35 births to every 1,000 of the population, or one to every 29. There are certain countries however in which the rate reaches a much higher standard than this average, as for instance in Servia, where it is as high as 42, and in Russia 49 or 50. On the other hand, there are countries which show a considerable diminution of this birth-rate, notably France: in this country the proportion to every 1,000 inhabitants is only 25 or 26; the same phenomenon is observable in Ireland, while in Connecticut and Rhode Island the proportion falls considerably below this average.

In the interior of a country there are very wide differences existing in the birth-rates of the urban and rural populations, and the variations are particularly noticeable in different districts of the same country. As an illustration of this, we may quote the case of Normandy, where it falls somewhat below 20, while in Alsace it exceeds 33 per 1,000. Again there are very marked differences perceptible in the birth-rate at different periods. There is a very great depression during periods of war, pestilence, or famine, but after a crisis the tendency is to mount upwards. During periods however which are not characterised by extremes of depression or inflation, the tendency is for each district to preserve its normal limit. When, however, the movement of the population is considered for any lengthened period, it will be found that, although never exceeding certain limits, considerable variations are observable in the birth-rate of different countries; in France, for example, under the Restoration, it averaged about 30·5 per 1,000, while during the decennial period 1871-80, it fell as low as 25·5. It is evident then that the movement of the population is regulated by laws

which are determined by physiological, climatic, moral, and social influences. These laws indicate a certain regularity of birth-rate, marriage-rate, and death-rate. They point to the existence of an average rate, differing according to groups of population, and show that differences may occur in the same group, all these variations, however, being kept within certain limits.

Coming next to the question of mortality, that is, the annual proportion of deaths to the total population, we find that among civilised races it is generally lower than the birth-rate. There are, of course, exceptions, as in the case of epidemics, famine, or wars, which have the effect of considerably raising the death-rate. During the year 1865, in Finland it averaged 79 per 1,000; and it is a significant fact that the result of such a disastrous period as was experienced during this year, has not only the effect of retarding the national growth by an excess of mortality, but it also causes a diminution in the birth-rate. This is exemplified by the returns showing the movement of the population in France during the year 1871, when we find that the death-rate exceeded 34, and the birth-rate fell below 23 per 1,000. At the present time the average death-rate is about 26 per 1,000. Among the Slav races in Servia, Russia, Croatia, and Hungary, it is a high one, fluctuating between 32 and 42; while in the Scandinavian countries it ranges only between 19 and 17, and in several of the North American States, between 19 and 16. In France the ratio of mortality is about 23 or 24 in every 1,000.

There is a very marked difference between the death-rates at various periods of life. The greatest mortality is observable among children in their earliest infancy. Speaking generally, it may be said that nearly 25 per cent. of children born, die during their first year of life. This infant mortality is also subject to considerable variation in different countries, for while in Norway it appears to be in the ratio of 10 to every 100, in Southern Germany it is as high as 30; and in the same country considerable differences exist between the rates, these being materially affected by the social conditions of the parents. Among the wealthier classes of the community the rate of infant mortality is very much lower than among the poorer classes; and this may be accounted for by the fact that the latter have not the means of providing so well for their children, or of bestowing so much care and attention on their treatment. Again, comparing legitimate and illegitimate births, it is observable that the deaths of illegitimate children are far in excess of those born in wedlock.

Comparing the number of male with the number of female births, it will be found that the former annually exceed the latter by about 5 per cent., and this percentage would be considerably increased if still-births were taken into account. To counteract this, the mortality is greater among male than female children, so that at maturity the numbers are to a great extent evenly balanced.

It may be said that out of every 100 persons born, only about 60 or 80 survive the age of 5. Of these, about 1 per cent. die between the ages of 10 and 30; and in the period comprised between

the ages of 30 and 70 there appears to be a gradual and progressive increase in the mortality, until towards the end of the period about 5 per cent. of the survivors are removed by death. From the age of 75 to 85 the mortality is naturally very much higher; about the latter period nearly 25 per cent. die off, and but a very small number attain their hundredth year. To put it in another form, out of every 1,000 individuals born, only 800 survive the first year; at the end of the fifth only about 700 remain; at the twentieth, 650; at the fiftieth, 450; at the seventieth, 220; and at the hundredth, with very rare exceptions, they are all extinct. During the course of a life there are two periods which are particularly exposed to an exceptionally high rate of mortality, that comprised between the birth and the fifth year, when there is a very great mortality among children who are of a naturally weak and delicate constitution, and between the ages of 70 and 80, when the vital powers become exhausted. In the intermediate periods there is such a considerable diminution of the death-rate, that it would appear to warrant the conclusion that the probable duration of a healthy life would average about seventy-five years.

As in every year a new generation springs up, so there are about one hundred generations existing at the same time, thus constituting a country's population; the earlier ones having but few survivors, and the later ones alone possessing nearly the whole of their numerical strength. Assuming that a generation consists originally of 1,000 newly born individuals, the survivors 1 year old will be 800; 2 years, 750; 3 years, 740; 4 years, 710; 5 years, 700, and so on. Taking the aggregate survivors of all the generations which at a given time constitute a country's population, it will be found that the composition is determined in very much the same manner as in the case of a particular generation, supposing the number of births in all to be equal. This cannot, however, invariably be the rule, as all generations at birth are rarely equal in numbers, and again, there must necessarily be very marked differences existing in the annual death-rate. Moreover, the duration of life is never the same in all countries; for instance, if we compare the two European countries exhibiting the extremes of mortality among children under the age of 5 years, we find that in Norway there are 820 living beyond that age, while in Russia there appear to be only 575. The excess of births over deaths is naturally the universal measure of the increase in population. Taking the European countries, we find that the average birth-rate is calculated to be 35, and the average death-rate 26 to every 1,000 inhabitants; consequently, there is an excess of births over deaths, and an average annual increase of 9 per 1,000.

This annual excess of births over deaths is subject to considerable variation in different countries. From an examination of the various census returns, it appears that while it ranged between 10 and 12 per 1,000 in Germany and England, it averaged only 5 per 1,000 in Hungary; and in France the small excess of births over deaths is particularly noticeable, the average proportional increase being since the commencement of the century in the ratio of 4.2, and the average has during the last twenty years fallen as low as

2·4 per 1,000. Of all the European countries in the nineteenth century, France is the one in which the slowest increase is observable in the population by the excess of births over deaths.

Coming next to the question of marriage and fecundity, we find that the proportion of marriages per 1,000 of the population averages a little over 8. Taking the whole of the European races, Turkey excepted, the highest marriage-rate is to be found in Servia, where it exceeds 11 per 1,000, and the lowest in the Scandinavian countries, where it averages about 7. At certain periods, in the year 1879 for instance, the number of marriages to every 1,000 inhabitants in Servia exceeded 15, and in France and Sweden, during the year 1870, it fell as low as 6 per 1,000. The average marriage-rate of France is somewhat below 8, the actual proportion being in the ratio of 7·9 to every 1,000 inhabitants. In the latter country about 78·5 per cent., or four-fifths, of the males who marry are between 20 and 35 years of age, and of this number 37 per cent. are between 25 and 30, while 90 per cent. of the women marry between 15 and 30, and about 38 per cent. of these are between 20 and 25. These figures may be taken as representing a general average, although the ages at which marriages are contracted, both in the case of men and women, are subject to considerable variation according to the country, its institutions, and the moral condition of the various classes of society. In England the tendency is for men to marry at an earlier age, as the vital statistics show a proportion of 48 per cent. between 20 and 25, and for women somewhat later in life, 83 per cent. only appearing to be under 30 at the time of contracting matrimonial alliances.

Coming next to the question of illegitimate births, we find that there are considerable divergences in nearly all the States between the highest birth-rate and the lowest. From an examination of the statistical returns which appear to furnish reliable information on this subject, it will be seen that the lowest rate, 3·4 to every 100, is to be found in the Netherlands, and in Bavaria the annual proportion appears to be in the ratio of 15·8. In France the proportion of illegitimate to total births is about 7·3 per cent. If we take 35 as representing the proportion of total births to every 1,000 of the population, of this number, legitimate births would average 32·5, and the illegitimate 2·5 per 1,000; and as the annual proportion of marriages is about 8, the proportion of legitimate births to marriages is 4 to each. This proportional number is also, in different countries, subject to considerable variation, for while it averages about 4 in Saxony, and in Russia probably 5, it is as low as 3·2 in France.

We will now consider the question of the distribution of the population, according to age, civil condition, and producing power. The population may be divided according to age into several groups. In the census returns of France for the year 1876, it was divided into three: the first including children under 15 years of age, the second, adults from 15 to 60, and the third, old people over 60 years of age. The proportions of each category to the total population were respectively 27, 61, and 12 per cent., as a reference to the following tabular statement will show:—

Groups.	Pro- portion to every 100 of the Popula- tion.	Civil Condition.							Sex.	
		Unmarried.		Married.			Widowers and Widows.			
		Males.	Fe- males.	Males.	Fe- males.	Total.	Widow- ers.	Widows	Males.	Fe- males.
<i>Children under 15 years of age. 27.1 per cent.—</i>										
Males	13.7	13.7	—	—	—	—	—	—	13.7	—
Females	13.4	—	13.4	—	—	—	—	—	—	13.4
<i>Adults from 15 to 60 years of age. 61.3 per cent.—</i>										
Unmarried { Males	12.4	12.4	—	—	—	—	—	—	12.4	—
{ Females..	10.3	—	10.3	—	—	—	—	—	—	10.3
Married { Males	16.9	—	—	16.9	34.8	{	—	—	16.9	—
{ Females..	17.9	—	—	—			17.9	—	—	—
Widowers { Widowers..	1.2	—	—	—	—	—	1.2	—	1.2	—
& Widows { Widows....	2.6	0.6	—	—	—	—	—	2.6	—	2.6
<i>Persons above 60 years of age. 11.6 per cent.—</i>										
Unmarried { Males	0.6	—	—	—	—	—	—	—	0.6	—
{ Females..	0.7	—	0.7	—	—	—	—	—	—	0.7
Married { Males	3.6	—	—	3.6	6.2	{	—	—	3.6	—
{ Females..	2.6	—	—	—			2.6	—	—	—
Widowers { Widowers..	1.3	—	—	—	—	—	1.3	—	1.3	—
& Widows { Widows...	2.8	—	—	—	—	—	—	2.8	—	2.8
Proportion per cent. } of total population }	100	26.7	24.4	20.5	20.5	40.1	2.5	5.4	49.7	50.3
		51.1		40.1		7.9		100		
100										

Although among the children under 15 years of age, and the aged persons over 60, there were many whose labours were not entirely unproductive, yet, speaking generally, it may be said that the producing population, that is those who by the fruit of their labour support the remainder, is composed of adults, and the class which is most dependent upon the work of others is that comprising the children, as any labour which they might perform would be comparatively unproductive. They are also naturally more dependent upon the exertions of others than many of the persons comprised in the third category, as the latter may have accumulated by a life of industry sufficient means to support them during the remainder of their existence. It follows, therefore, that those nations which are most fruitful are called upon to make the greatest sacrifices, in supporting a larger number of the helpless, by the labours and wealth of the productive classes. As an illustration of this we may quote the case of Germany, where according to the census returns of 1871, the proportion of children to the total population exceeded 34 per cent.; while, on the other hand, in France during the year 1876, the proportion of children averaged

less than 27 per cent. If we analyse the composition of these three groups of children, adults, and aged persons, comprising the population of France according to the census returns of 1876, we arrive at the following results:—

The two sexes appear to be almost evenly balanced, although the tendency of male births is to preponderate in a marked degree. But notwithstanding the fact that the number of male are considerably in excess of the female children, yet the diseases incidental to childhood, and the wear and tear of life, have the effect of causing a much higher rate in the mortality among men than women, so that in the majority of the European countries it will be found that the numbers of females living, are slightly in excess of the males, and this numerical inferiority of the male sex is brought into greater relief after any destructive wars. But in many of the colonies, the number of males is greatly in excess of females, owing to immigration, which is resorted to more largely by men than by women.

Bachelors and spinsters in France constitute half of the total population, and they may be divided into two very unequal parts; the children who live at home, and are supported by the exertions of the family of which they form a part, and adults who, less numerous (the actual proportion being in the year 1876 in the ratio of 8 to 11), lead an independent existence. The remainder of the population is composed of persons who are either married or have been married. In the latter category are comprised nearly a fifth of this moiety, or about one-twelfth of the whole population, and this fifth, again, is made up of twice as many women as men, and this may be accounted for by the fact that second marriages are more rarely contracted by widows than by widowers. Therefore, more than four-fifths of this moiety, or rather more than two-fifths of the total population, are actually married. As the aged persons have but very rarely any young children to provide for, it follows that it is upon the vigorous and industrious class, or to speak more correctly, the younger portion of the community, that the heaviest burden is laid of providing for the wants of the infant population. This class, which includes children under 15 years of age, represents more than a quarter of the total population, the actual proportion being in the ratio of 29 per cent. Owing to excessive infant mortality in France, although the numerical expression which represents the fruitfulness of marriages appears to be rather more than 3 children to each, the number actually arriving at maturity averages considerably less than 3, hence the slow increase of the French population. The proportions of these three groups vary within certain limits according to country. As a general rule, it may be taken that the conditions of a population in which the proportion of the adult group is relatively high, are more favourable to the acquisition of material prosperity and the accumulation of wealth, the producing power being greater, and the number of consumers smaller, than would be found in a population having a larger proportion of children and old people.

Coming next to the question of the causes affecting the density of the population, it may be laid down as a general rule that the

distribution of the population in different parts of the globe is affected by the degree of facility with which the means of existence are procured. But there are many circumstances that operate against this theory being accepted as an absolute rule, the principal reason being that the expression *means of subsistence* is a vague term, and one which does not convey the same meaning at all times and in all countries. It will be found that the density of the Hindoo population is estimated in the proportion of more than 100 to the square kilometre, both the production and consumption of this race being infinitely less than that of the French, who average less than 71 to the same extent of territory. Still, as showing the application of the general rule, it may be observed that the frigid zone, which offers very few facilities for obtaining the means of subsistence, is almost uninhabited, and in the deserts, the mountain districts, and steppes, owing to their unfitness for cultivation, the population is comparatively sparse; while, on the other hand, in the plains and valleys, which are watered by navigable streams, and in which the soil is fertile and productive, on the sea coasts where fish is found in abundance, and where commercial ports are constructed, in the vicinity of factories and coal mines, and in large towns where capital is plentiful and labour is in great demand, there is a marked tendency for the population to become dense. It will be seen, therefore, that very wide differences exist between the number of persons inhabiting the same extent of territory; for example, while a square kilometre in Archangel has only a density of '4, and Astrachan 2.9, in the manufacturing districts of Lancashire there are 707 inhabitants to every square kilometre of ground.

Man is naturally attracted to regions where the fertility of the soil, the natural resources of the country, and advanced civilisation, inspire him with the belief that his labours will prove remunerative; he settles there and multiplies. The consequence is that not only are the regions which possess these advantages more densely populated, but they are also characterised by a more rapid increase of the population. It would seem, at first sight, that in any given country, a district which has a population of only 50 inhabitants to the square kilometre would be more likely to attract fresh inhabitants than one which has 150. But we find from the census returns that it is precisely the reverse, as the density is infinitely greater in the latter district, owing to the fact that it possesses a larger share of the elements of wealth.

The attraction of population towards those districts possessing great natural advantages may be so pronounced, that in a country not distinguished by a very rapid increase of population, the result of concentration in the great centres of industry and commerce is to cause a considerable diminution in the number of inhabitants left in the less favoured districts. This phenomenon has for the last few years been particularly noticeable in France. It will therefore be found that any of the causes which influence the density of the population, such as the discovery of a mine, the construction of an important commercial port, the opening of a new line of railway, or the establishment of an administrative centre in any country, will cause a considerable influx of inhabitants to the dis-

trict affected, and the tendency of the population is in a marked degree to increase there.

Looking next into the question of the balance of population and wealth, we find that there are many circumstances which point to the conclusion that a very close connection exists between the number of inhabitants in a country, and the actual wealth produced in that country. The first economist who sought to accurately determine the exact relation of population to wealth was Malthus. In his essay on the principle of population, he mentions that he was struck with the constant tendency of all animated life to increase considerably beyond the means of subsistence.

His theory was that the tendency of the population increases in a geometrical series of 1, 2, 4, 8, 16, 32, 64, 128, 256; while on the other hand the supply of food increases in the arithmetical series of 1, 2, 3, 4, 5, 6, 7, 8, 9; and therefore in two centuries the population would be to the means of subsistence as 256 to 9; in three centuries as 4,096 to 13; and in two thousand years the difference would be almost incalculable. The deductions he drew were that if man did not voluntarily check population by self restraint and the exercise of his reasoning faculties, which enable him to calculate distant consequences, the effect of the population not being kept equal to, or beneath the level of the means of existence, would be distress and misery, and even death from actual want.

But we may observe that it is somewhat hazardous to attempt to express by a mathematical formula a variable ratio, which does not admit of numerical precision. As a matter of fact there are few countries in which the progression of the population is geometrical. This may however be the case in those new countries which colonisation enriches with a race of civilised men. In the United States it will be found that taking thirty-year periods, the tendency of the population is to increase in the geometrical series of 1, 2, 4, &c., but we must not forget that this growth is in a great measure due to the effects of immigration, which has introduced into this country in the period comprised between 1820 and 1880, about 10 millions of people. The following table shows the population of the United States according to the census returns of each thirty years, and the proportionate rate of progression:—

Census Year.	Population.	Progression since 1790.
1790	3,929,000	1·0
1820	9,665,000	2·7
'50	23,191,000	5·9
'80	50,155,000	12·7

A similar result is to be found in Canada and the Australian Colonies, and in these countries food supplies and wealth in general have not increased with less rapidity than population. We may judge by the amount of the foreign trade of the United States, which from 1790 to 1800 averaged about 107 millions of dollars,

had in 1880 increased to a value exceeding 1,503 millions of dollars, and although the development of the foreign trade was somewhat slower than that of the home trade, it increased in the ratio of 1 to 14, while the expansion of the population was in the proportion of 1 to 12·7.

Among savage races, whose supply of animal and vegetable food is extremely scanty, and where the production of wealth is insignificant and remains stationary owing to the absence of any progress in industrial science, the rate of mortality is naturally high; it is not therefore necessary, as Malthus supposed, for death to sweep away at regular intervals the superabundant population of each generation in order to reduce the population to the limits of production. The institutions of a country, and the moral condition of its people, exercise an unmistakable influence as a preventive check. In the absence of any reliable data bearing upon this particular question in lands not brought under the influences of civilisation, we have relied mainly upon the observations of a Frenchman, who lived for more than seventeen years among the savage tribes in the north of Australia. He states that it is the exception for women who have borne children to have more than three or four surviving the age of 5 years. We must, therefore, seek elsewhere than in the Malthusian formulas for the true experimental laws of population.

On the other hand, the science of demography, by which the birth-rate, marriage-rate, mortality and density is calculated, is far from supplying us with all the elements necessary to the acquirement of a thorough knowledge of the laws of population; it no more enables us to fathom the whole secret of the economic conditions of people than does the knowledge of this economic condition give us the key to the secret of their moral condition. Births, life, and death are doubtless very significant phenomena, but in the first place we must not forget that these phenomena depend more upon the physiological than the social condition of man. In the second place there are many different ways of living, and although material ease must necessarily conduce to the prolongation of existence, yet the actual average duration of life cannot be regarded as the exact measure of the degree of a nation's wealth or the equity of its distribution.

But to sum up the data which we have collected, with the object of throwing light on this complex problem, we may infer that the number of inhabitants that a country is capable of supporting depends upon:—

1. The physical conditions of the climate and the soil.
2. The amount of capital, and the state of industrial science, which have the effect of considerably augmenting the productiveness of labour.
3. The facilities for the interchange of commodities, as it is indispensable for the population to obtain food supplies in exchange for the produce of their industry.
4. The average individual consumption, which exercises great influence over the number of the population. In a country of limited wealth, the lower this average is, the greater will be the abundance of food supplies, and consequently an increase in the supporting power of the country.

To the last point we have however already alluded at the commencement of this article; with regard to the first proposition, that relating to climate and the soil, it is obvious that man, in the generality of cases, can exercise but a very trifling influence over these. He can, and does, however, exercise a sovereign influence over the second and third, and these in their turn exercise a preponderating and invariably favourable influence by their augmentation on the increase of the population. They are in themselves the cause of density, although in some few cases, as for example in the employment of agricultural machinery, the progress of industrial science has a tendency to diminish rather than to augment population in agricultural districts.

It may not be out of place here to call attention to those periods of economic civilisation to which we refer when speaking of the cultivation of the soil:—

The *savage period*, in which the supplies derived from hunting and fishing were insufficient to support even one inhabitant to the square kilometre.

The *pastoral period*, when the breeding of cattle hardly furnished sufficient subsistence for three or four inhabitants to the square kilometre.

The *agricultural period*, when the cultivation of the soil with even a limited capital would support, at least in Europe, from twenty to fifty inhabitants per square kilometre.

The *industrial and commercial period*, when, owing to the perfected system of cultivation, necessitating a considerable outlay of capital, and to the importation of supplementary food supplies, acquired by the wealth obtained on the spot, to every square kilometre many hundreds of inhabitants might exist.

As regards the fourth proposition, that relating to the influence exercised over the numbers of the population by the average individual consumption, it may be as well to remark that this may occasionally be attended with disastrous results, as, for instance, when in a comparatively wealthy district the population is found to be very numerous, because it consumes but little, then the inhabitants must be in a miserable condition. There can be no question that one of the happiest results of social economy would be to raise the average consumption, provided always that the consumption be not wasteful, and thereby improve the material condition of the great mass of the population and add to their comfort and wellbeing.

To the inferences we have drawn we may add the following:—

By virtue of certain physiological, economic, and social laws, the population at the present time in civilised countries is marked by a general tendency to increase by an excess of births over deaths.

In great commercial centres where trade is flourishing, and a vast number of people are actively engaged in the various mining and manufacturing industries, it will be found that population is largely reinforced by immigration.

In a great measure, owing to the very rapid strides which have of late years been made in the progress of industrial science, the increased producing power has generally resulted in a greater

growth of wealth than of population. This has not, however, been invariably the case; history in fact tells us that there have been periods when the wealth and population of a country have not only remained stationary, but that retrograde movements have actually taken place.

It frequently happens that proportionately with an increase in the wealth of a population, there is a tendency to a diminution in the birth-rate, and although infant mortality is also lower, the actual growth of the population advances but slowly. Among the same race of people this tendency is particularly noticeable in the wealthy classes of the community. There are many reasons which may be adduced to account for this phenomenon, one of the principal being that it is almost invariably from among those who were originally in a much inferior station of life, but who have succeeded, by their industry, in raising themselves, that the ranks of the wealthier classes of society are recruited. Many circumstances, however, point to the conclusion that this is a rule which is subject to very considerable modification. The question of the growth of population is one which has a bearing upon the economical as well as the political condition of a country. Looking at it first in its economical aspect, a population which rapidly increases has a large number of children to support and bring up; for the time being this must form a heavy burden weighing upon the active population and necessarily affecting its material prosperity. But as man is *par excellence* the producing power, the young generation, when arriving at maturity, constitutes a more abundant source of wealth. There is one consideration, however, to be observed, that is, that in the growth of the population there should be a proportionate increase in capital.

There is unquestionably a limit to the number of inhabitants which a given space is capable of supporting, but some doubt appears to exist as to what this limit actually is; it is apparently impossible to accurately define it, as it has a tendency to recede as progress is made in industrial science. When at a given point in the advance of this science the limit is exceeded, the industrial population may still be supported by imported food supplies, and the wealth which is acquired from the pursuit of manufacturing industries and exchanged for these commodities is infinitely less restricted than that derivable from the cultivation of the soil. It is manifest that to meet the demand which exists in many countries for imported food supplies, there must necessarily be a superabundance of agricultural produce in others; but this is a want which is easily supplied, as the day is yet far distant when, as Jules Duval expresses it, the earth will become so over-populated that it will be impossible for any country to produce more than is actually sufficient to provide for the necessities of its own inhabitants.

The improvements which have been effected in the various means of communication—a characteristic feature of the advance of industrial science—have greatly facilitated importation, and thereby exercised considerable influence over the density of certain groups of the population.

Coming next to the political side of the question, it is evident

that a country which has a more rapid increase of population than its neighbours is relatively the strongest, as it can not only put a more powerful army in the field, providing the state of its finances permit, but it also possesses a larger share of the world's commerce, and carries greater weight in all international questions. It is for this reason that the United States, with its population exceeding 50 millions, has become one of the most powerful nations of the world.

We will now turn to the question of emigration and colonisation. Emigration may be determined by a variety of causes, among them being:—

1. The impossibility of adequately providing for their own wants, and of gaining sufficient to support their families, which impels many to leave their native country, and to seek elsewhere the means of existence.

2. The prospect of a brighter future in foreign lands.

3. Political considerations, which may render it impossible for a certain section of the population to remain in their own country.

4. Increased facilities of communication. The relations established between the countries of emigration and immigration. The conditions of public institutions or private enterprise, which in the country of origin contribute to stimulate the flow of emigration, and in the country of destination to attract immigration.

The first of these reasons more particularly induces the poorer classes of the population to resort to emigration, and operates with greater force in times of adversity and depression.

The second affects more particularly that portion of the community of which the middle classes is composed; but it would only appear to operate upon a relatively limited number of individuals, as those who have succeeded in acquiring a certain *status* in their own country, are not so disposed to relinquish it and commence a new life in a foreign land as those who have no established position.

Coming next to the consideration of the influences exercised upon the flow of emigration by political complications, the effect of these has frequently been to people a new country with men possessing in a high degree those moral and intellectual qualifications which are essential to the establishment of a well regulated society.

The facilities of communication, the relations established between the various countries, the particular institutions of a country, and private enterprise, all contribute in a very material degree to augment and regulate the flow of emigration.

The countries to which immigration is mainly directed may be distinguished as old and new countries. The former comprise those in which the land is entirely appropriated and under cultivation, and to these it is manifest that the immigrant is drawn by other attractions than the prospect of deriving the means of subsistence from the fertility of the soil.

Between these old countries there are certain tides of emigration which are determined by private interests, and which have the effect of introducing in nearly every country men of almost every nationality. There also exist certain general currents, one of which bears from those countries which are the most advanced in civilisation and the arts towards those whose progress has not been

so marked, emigrants coming under the second category (those influenced by brighter prospects); these are principally taken from among the professional and mercantile classes. There is another which carries with it from countries having a larger proportion of inhabitants than of capital, to those possessing a greater share of capital than population, emigrants coming under the first category, chiefly the salaried class.

In France there is particularly observable a current of immigration of this description, and it bears with it to the north a large number of Belgians and Germans, and to the south-east a large proportion of Italians.

When these currents are opposed by emigration laws, economical progress is checked, as it is always to be desired that capital which may be seeking for labour, and labour for capital, may have the opportunities of coming together. A country which checks emigration attacks the liberty of the subject, and condemns a number of its inhabitants to a life of misery; but on the other hand, a State which exposes the numerous frauds which are frequently resorted to with the object of inducing many to leave their homes, is entitled to the gratitude of its citizens whose interests it watches over. A country which prevents emigration strikes at the liberty of labour, and impedes the growth of national capital. But looking at it as a question of policy, it is obvious that it would be far more to the advantage of a country to be able to provide by the growth of its own population for the fresh employments demanded by the expansion of its capital.

Immigration into new countries is closely connected with the question of colonisation—it is, in fact, the hope of acquiring a portion of the land and settling upon it that induces many to emigrate, and this even influences that particular class which, at the commencement, has no immediate prospect beyond the earning of wages. It is therefore towards those countries in which the wealth, both mineral and agricultural, is not entirely appropriated, that the stream of emigration is chiefly directed.

There can be no question but that, looking at it in a broad light, a judicious system of emigration is a benefit to humanity at large, since its immediate effect is not only the utilisation in the world of a vaster amount of natural wealth, but the more complete acquirement by civilised man of the land, his natural domain.

It is also an advantage to the emigrants themselves, as the majority settle in the land of their adoption, and obtain with greater facility the necessities of life for themselves and their families, and in greater abundance, than they would have been able to do in their own native country.

Looking at the system of emigration also from a political and economical point of view, it is manifest that it is an advantage to the new country, whose natural wealth is greatly enhanced by the infusion of fresh capital and labour, both being indispensable to the development of its resources.

It is an advantage to the country which the emigrants leave, as it is a direct gainer if the new country is one of its own colonial possessions, and it is benefited indirectly if it is not, for fresh

colonisation must of itself be productive of great good, inasmuch as its immediate effect is to give an impetus to the world's trade, owing to the establishment of new commercial centres; and the commercial interests of that particular country from which the emigrants are taken, must be materially advanced by reason of the introduction into a new country of its language, manners, and customs. Both the economical and political influences of the mother country must be diffused throughout the world by the multitudes who leave it. So it is obvious that it would be well for a country with colonial possessions to take all the steps necessary to render the condition of things there favourable to colonisation; and a new country should endeavour, as far as practicable, to attract immigration. It is through colonisation that the European race has, since the discovery of Columbus, spread over nearly the whole of that area in North America comprised between 52 degrees and 22 degrees parallel of latitude; that it has mingled with or partially taken the place of the indigenous races in the tropical and subtropical zones of North and South America; that it has populated the southern portion and the Mediterranean region of Africa; it has also been the means of establishing the dominion of the European race in India, in parts of Indo-China, the Malay Archipelago, and Liberia; and of creating in the nineteenth century a new centre of civilisation in Australia. The representatives of European races, pure or mixed, now inhabiting extra-European countries at the present time, may be approximately estimated at 85 millions; and the immense influence this dissemination exercises not only over European and even national wealth, but over the politics of modern times, cannot be too highly estimated.

In conclusion, the inferences which we have drawn may be briefly summarised as follows:—

Between the three terms of population, production, and consumption, there must necessarily exist a relation.

As regards the balance of wealth and population, it may be accepted as a general theory that when production and capital both increase, the tendency is for population also to increase. When the mean individual consumption increases, the tendency is for the growth of the population to be less rapid, or even to become stationary.

When the most fertile lands have been long under cultivation, and the fruits of the soil are extracted with increased difficulty, the expansion of the population becomes less easy. When the distribution of wealth becomes more equalised, then the growth of the population will be accelerated. Statistics prove that the average proportion of births, deaths, and marriages to every 1,000 of the population in Europe, is in the ratio of 35, 26, and 8, and in spite of certain annual fluctuations, each country has an almost unvarying birth, marriage, and death-rate. Mortality is highest during the first five years of life. The probable duration of a healthy life should average about 75 years.

By the excess of births over deaths there is an average annual increase in Europe of 9 in every 1,000 inhabitants. The average number of children to each marriage appears to be about 4; illegiti-

mate births appear besides to be in the ratio of 7 to every 100 children born in or out of wedlock.

The proportion between the sexes in European populations appears to be very evenly maintained, though the inclination is to a slight numerical inferiority in the male sex, notwithstanding the fact that the number of male births considerably preponderate.

In France, *célibataires*, chiefly children and adults, compose half of the entire population, those in wedlock forming the remainder; about a fifth part of this moiety are either widows or widowers, and more than four-fifths are actually married.

A population having a large proportion of adults is in a condition favourable to the attainment of material prosperity.

The population is distributed over different parts of the globe in proportion to the means of existence furnished. In valleys, arable plains, and mining districts, on the sea coasts, and in the neighbourhood of large towns, &c., population has a tendency to become denser.

The number of inhabitants which a given space is capable of supporting depends upon the physical condition of the climate and soil, on capital, and the state of industrial science, and on the average individual consumption. Population has a general tendency to augment by an excess of births over deaths. It is considerably augmented by immigration. At the present time, in the majority of civilised countries, capital increases faster than population. It is frequently found that in a population whose wealth is on the increase, there is a marked tendency to diminution in the numbers. A heavy burden is imposed for the time being on a population whose increase is rapid; but this rapid increase must constitute in the future an abundant source of wealth.

Emigration may be determined by a variety of causes, among others, insufficiency of the means of existence, or the prospect of an improved position, political complications, or again, facilities of communication.

In old countries a stream of immigration appears to flow from those parts in which rapid strides have been made in civilisation and the arts, and is directed towards less favoured regions. Or again, there is to be found a constant stream of immigrants directed towards countries having relatively more capital than population, from countries not possessing these advantages.

Immigration in new lands, and colonisation, benefit mankind, the emigrants themselves, the new country which receives them, and the old country which they leave.

III.—*Lloyd's Statistics of Marine Casualties for the Year 1882.*

THE following statistics of marine losses and casualties, furnished by *Lloyd's* from the reports made to that corporation for the year 1882, are given in continuation of similar information for previous years that have appeared exclusively in the *Journal of the Statistical Society*, commencing with 1872, and are in continuation of a similar series formerly printed and published by the Committee at *Lloyd's*, but the publication of which was discontinued.

1.—A Table showing the Number of Wrecks and Casualties to Sailing Vessels and Steamers Compared with the Average Number and

Sailing Vessels.	First Half-Year.				Second Half-Year.				Annual Total.			
	1882.		Average 16 previous Years.		1882.		Average 16 previous Years.		1882.		Average 16 previous Years.	
	Num- ber.	Per Cent.	Num- ber.	Per Cent.	Num- ber.	Per Cent.	Num- ber.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.
1. Missing	79	1'76	57	1'18	27	0'54	28	0'48	106	1'12	85	0'80
2. Abandoned—												
Recovered	36	0'80	30	0'63	52	1'05	42	0'72	88	0'93	72	0'68
Lost	84	1'87	117	2'41	114	2'39	131	2'24	198	2'09	247	2'32
Total	120	2'67	147	3'04	166	3'34	173	2'96	286	3'02	319	3'00
3. Collision—												
Not damaged	212	4'71	229	4'74	253	5'09	293	5'01	465	4'91	521	4'89
Damaged	434	9'65	557	11'57	523	10'52	652	11'17	957	10'11	1,210	11'35
Sunk	83	1'85	75	1'55	95	1'91	84	1'43	178	1'88	158	1'49
Total	729	16'21	861	17'86	871	17'52	1,029	17'61	1,600	16'90	1,889	17'73
4. Sinking from causes other than collision	161	3'58	145	3'02	148	2'98	176	3'01	309	3'25	321	3'01
5. Stranded—												
Got off	604	13'43	701	14'54	687	13'81	774	13'26	1,291	13'63	1,475	13'84
Not got off	408	9'07	462	9'59	549	11'04	623	10'67	957	10'11	1,085	10'18
Subsequent fate not reported }	56	1'25	109	2'28	47	0'95	166	2'85	103	1'09	275	2'59
Total	1,068	23'75	1,272	26'41	1,283	25'80	1,563	26'78	2,351	24'83	2,835	26'61
6. Capture	—	—	3	0'06	—	—	7	0'11	—	—	9	0'09
7. Piracy	—	—	1	0'03	—	—	2	0'03	—	—	3	0'03
8. Burnt or on fire	61	1'35	64	1'33	59	1'19	74	1'27	120	1'27	138	1'30
9. Dismasted or disabled	154	3'42	191	3'97	198	3'98	273	4'68	352	3'72	464	4'35
10. Jettison of cargo under deck	95	2'11	94	1'95	68	1'37	90	1'54	163	1'72	184	1'73
11. Jettison of deck-load or washed overboard	107	2'38	54	1'11	146	2'93	129	2'22	253	2'67	183	1'72
12. Leaky	501	11'21	497	10'30	527	10'59	633	10'85	1,031	10'89	1,130	10'61
13. Loss of anchors or chains	173	3'85	224	4'64	261	5'25	268	4'59	434	4'58	491	4'61
14. Machinery damaged, &c.	—	—	—	—	—	—	—	—	—	—	—	—
15. Mutiny, sickness, casualty to crew, or refusing duty	74	1'65	112	2'33	62	1'25	110	1'88	136	1'44	222	2'09
16. Ship damaged, &c.	1,159	25'79	1,088	22'58	1,141	22'94	1,264	21'66	2,300	24'29	2,352	22'07
17. Water-logged	12	0'27	9	0'19	16	0'32	18	0'32	28	0'30	27	0'25
Number of casualties.	4,496	—	4,819	—	4,973	—	5,873	—	9,469	—	10,655	—
Number of vessels	4,235	—	4,495	—	4,690	—	5,461	—	8,925	—	9,959	—

2.—A Table showing the Results of Wrecks and Casualties to Ship and to Cargo, with Salvage during the Year 1882, and the respective Percentages thereon, Compared

Sailing Vessels.	First Half-Year.				Second Half-Year.				Annual Total.			
	1882.		Average 16 previous Years.		1882.		Average 16 previous Years.		1882.		Average 16 previous Years.	
	Num- ber.	Per Cent.	Num- ber.	Per Cent.	Num- ber.	Per Cent.	Num- ber.	Per Cent.	Number.	Per Cent.	Num- ber.	Per Cent.
<i>Results to Ship—</i>												
Total loss	802	18.94	824	18.33	922	19.66	1,028	18.81	1,724	19.32	1,852	18.59
Constructive loss	51	1.20	84	1.88	38	0.81	76	1.39	89	1.00	160	1.61
Great damage.....	349	8.24	467	10.38	407	8.68	607	11.11	756	8.47	1,074	10.78
Minor damage	2,076	49.02	2,121	47.17	2,199	46.89	2,517	46.06	4,275	47.90	4,637	46.56
Raised aftersink- ing.....	31	0.73	22	0.49	10	0.21	20	0.36	41	0.46	42	0.42
Not damaged or results un- known	926	21.87	977	21.75	1,114	23.75	1,217	22.27	2,040	22.85	2,194	22.04
Total	1,235	—	1,495	—	1,690	—	5,464	—	8,925	—	9,959	—
<i>Results to Cargo so far as reported—</i>												
All lost	366	8.64	452	10.06	406	8.66	488	8.93	772	8.65	941	9.44
Part lost	257	6.07	233	5.19	266	5.67	305	5.59	523	5.86	532	5.35
All saved	9	0.21	16	0.37	11	0.23	15	0.28	20	0.22	32	0.32
Forwarded	5	0.12	15	0.33	3	0.06	9	0.16	8	0.09	23	0.24
Heated	6	0.14	9	0.20	5	0.11	9	0.16	11	0.12	18	0.18
Shifted	49	1.16	59	1.33	35	0.74	69	1.26	84	0.94	128	1.29
Otherwise damaged	106	2.50	84	1.87	75	1.60	78	1.43	181	2.03	162	1.63
Salvage Services	239	5.64	416	9.26	354	7.55	478	8.74	593	6.64	896	9.00
<i>Lives—</i>												
Crews saved	472	11.14	442	9.83	605	12.90	543	9.93	1,077	12.07	985	9.89
Crews drowned	99	2.34	55	1.23	46	0.98	45	0.82	145	1.62	100	1.01
Lives lost so far as reported (in both ships and steamers)	830	—	950	—	894	—	851	—	1,724	—	1,801	—

3.—A Table showing the Number of Wrecks and Casualties to Sailing Vessels reported Compared with the Average Number and Percentages

Sailing Vessels.	First Quarter.				Second Quarter.			
	1882.		Average Sixteen previous Years.		1882.		Average Sixteen previous Years.	
	Number.	Per-centage.	Number.	Per-centage.	Number.	Per-centage.	Number.	Per-centage.
1. <i>Missing</i>	59	2'34	27	0'89	20	1'02	30	1'66
2. <i>Abandoned</i> —								
Recovered.....	20	0'78	18	0'61	16	0'82	12	0'65
Lost	45	1'77	70	2'31	39	2'00	46	2'60
Total	65	2'55	88	2'92	55	2'82	58	3'25
3. <i>Collision</i> —								
Not damaged	124	4'87	136	4'49	88	4'51	92	5'18
Damaged	255	10'02	342	11'27	179	9'17	215	12'08
Sunk	44	1'73	43	1'42	39	2'09	32	1'77
Total	423	16'62	521	17'18	306	15'68	339	19'03
4. Sinking from causes } other than collision }	81	3'18	81	2'66	80	4'10	65	3'63
5. <i>Stranded</i> —								
Got off	331	13'01	403	13'29	273	13'99	297	16'67
Not got off	215	8'45	296	9'74	193	9'89	167	9'34
Subsequent fate not } reported	36	1'42	73	2'40	20	1'02	37	2'06
Total	582	22'88	772	25'43	486	24'90	501	28'07
6. Capture	—	—	1	0'04	—	—	1	0'08
7. Piracy	—	—	1	0'02	—	—	1	0'03
8. Burnt or on fire	35	1'38	35	1'16	26	1'33	29	1'63
9. Dismasted or disabled ...	76	2'99	113	3'72	78	3'99	78	4'39
10. Jettison of cargo } under deck	49	1'93	62	2'03	46	2'36	32	1'80
11. Jettison of deckload or } washed overboard.... }	75	2'95	33	1'09	32	1'64	20	1'15
12. Leaky	289	11'36	310	10'22	215	11'01	186	10'45
13. Loss of anchors or } chains	100	3'93	175	5'78	73	3'74	48	2'71
14. Mutiny, sickness, } casualty to crew, or } refusing duty	51	2'01	68	2'26	23	1'18	44	2'45
15. Ship damaged, loss of } bulwarks, &c. }	654	25'71	742	24'44	505	25'87	346	19'42
16. Water-logged	5	0'20	5	0'16	7	0'36	4	0'25
Number of casualties	2,544	—	3,035	—	1,952	—	1,783	—
Number of vessels	2,381	—	2,804	—	1,854	—	1,691	—

in "*Lloyd's List*," during the Four Quarters of 1882, and the respective Percentages thereon, for the same period of the Sixteen Previous Years.

Third Quarter.				Fourth Quarter.				Sailing Vessels.
1882.		Average Sixteen previous Years.		1882.		Average Sixteen previous Years.		
Number.	Per-centage.	Number.	Per-centage.	Number.	Per-centage.	Number.	Per-centage.	
11	0'69	14	0'75	16	0'47	14	0'35	1. <i>Missing</i>
13	0'82	12	0'61	39	1'15	30	0'77	2. <i>Abandoned—</i>
21	1'33	34	1'79	93	2'74	97	2'47	Recovered
34	2'15	46	2'4	132	3'89	127	3'24	Lost
102	6'45	113	5'94	151	4'45	180	4'57	Total
208	13'16	247	13'02	315	9'29	405	10'28	3. <i>Collision—</i>
43	2'72	34	1'77	52	1'53	50	1'27	Not damaged
353	22'33	394	20'73	518	15'27	635	16'12	Damaged
55	3'48	66	3'49	93	2'74	109	2'77	Sunk
247	15'62	289	15'22	440	12'97	484	12'32	Total
140	8'86	179	9'42	409	12'06	444	11'27	4. Sinking from causes
31	1'96	44	2'34	16	0'47	122	3'09	other than collision
418	26'44	512	26'98	865	25'5	1,050	26'68	5. <i>Stranded—</i>
—	—	3	0'13	—	—	4	0'10	Got off
—	—	1	0'05	—	—	1	0'01	Not got off
30	1'90	31	1'65	29	0'85	43	1'09	{ Subsequent fate not reported
61	3'86	95	4'99	137	4'04	178	4'52	
19	1'20	30	1'57	49	1'45	61	1'54	Total
26	1'64	22	1'17	120	3'54	107	2'72	6. Capture
184	11'64	234	12'33	343	10'11	399	10'14	7. Piracy
48	3'04	47	2'47	213	6'28	221	5'61	8. Burnt or on fire
24	1'52	45	2'39	38	1'12	64	1'64	9. Dismasted or disabled
313	19'80	354	18'61	828	24'41	911	23'13	10. Jettison of cargo
5	0'31	6	0'29	11	0'33	13	0'32	under deck
1,581	—	1,900	—	3,392	—	3,937	—	11. Jettison of deckload or
1,550	—	1,813	—	3,140	—	3,651	—	washed overboard
								12. Leaky
								13. Loss of anchors or
								chains
								14. Mutiny, sickness,
								casualty to crew, or
								refusing duty
								15. Ship damaged, loss of
								bulwarks, &c.
								16. Water-logged

4.—A Table showing the Number of Wrecks and Casualties to Steamers reported in Compared with the Average Number and Percentages

Steamers.	First Quarter.				Second Quarter.			
	1882.		Average Sixteen previous Years.		1882.		Average Sixteen previous Years.	
	Number.	Per-centage.	Number.	Per-centage.	Number.	Per-centage.	Number.	Per-centage.
1. Missing	14	1'35	5	0'77	4	0'52	2	0'43
2. Abandoned—								
Recovered	—	—	—	—	—	—	—	—
Lost	1	0'10	1	0'26	2	0'26	1	0'19
Total	1	0'10	2	0'28	2	0'26	1	0'26
3. Collision—								
Not damaged	129	12'48	86	14'39	76	9'91	70	16'27
Damaged	112	10'83	78	13'07	57	7'43	53	12'29
Sunk	9	0'87	7	1'27	11	1'43	5	1'16
Total	250	24'18	171	28'73	144	18'17	128	29'71
4. Sinking from causes } other than collision }	20	1'96	11	1'96	21	2'74	9	2'13
5. Stranded—								
Got off	251	24'28	119	19'93	165	21'51	99	22'95
Not got off	30	2'90	20	3'40	18	2'35	15	3'52
Subsequent fate not } reported	5	0'48	6	1'03	6	0'78	4	0'81
Total	286	27'66	145	24'36	189	24'64	118	27'28
6. Capture	—	—	—	—	—	—	—	—
7. Piracy	—	—	—	—	—	—	—	—
8. Burnt or on fire	22	2'12	12	2'03	21	2'74	13	3'02
9. Dismasted or disabled ..	6	0'58	6	0'89	2	0'26	3	0'69
10. Jettison of cargo } under deck	27	2'61	12	1'95	20	2'61	10	2'34
11. Jettison of deckload or } washed overboard.. }	5	0'48	7	1'12	7	0'91	2	0'45
12. Leaky	18	1'74	15	2'56	18	2'35	12	2'68
13. Loss of anchors or } chains	15	1'44	9	1'46	4	0'52	3	0'74
14. Machinery damaged } or short of coals }	158	15'28	106	17'86	161	20'99	87	20'15
15. Mutiny, sickness, } casualty to crew, or } refusing duty	3	0'29	5	0'90	2	0'26	4	1'01
16. Ship damaged, loss of } sails, bulwarks, &c. }	209	20'21	90	15'11	172	23'03	39	9'04
17. Water-logged	—	—	—	—	—	—	—	—
Number of casualties.....	1,034	—	596	—	767	—	432	—
Number of steamers	996	—	575	—	739	—	414	—

"*Lloyd's List*," during the Four Quarters of 1882, and the respective Percentages thereon, for the same period of the Sixteen Previous Years.

Third Quarter.				Fourth Quarter.				Steamers.
1882.		Average Sixteen previous Years.		1882.		Average Sixteen previous Years.		
Number.	Per-centage.	Number.	Per-centage.	Number.	Per-centage.	Number.	Per-centage.	
2	0'30	1	0'11	6	0'50	2	0'32	1. <i>Missing</i>
—	—	—	—	—	—	—	—	2. <i>Abandoned—</i> Recovered Lost
1	0'15	1	0'12	2	0'16	1	0'17	Total
1	0'15	1	0'13	2	0'16	1	0'21	3. <i>Collision—</i> Not damaged Damaged Sunk
111	16'62	84	18'48	136	11'22	118	15'74	Total
88	13'17	67	14'76	132	10'89	96	12'85	4. Sinking from causes other than collision
11	1'65	7	1'53	20	1'65	10	1'27	
210	31'44	158	34'77	288	23'76	224	29'86	5. <i>Stranded—</i> Got off Not got off
12	1'80	10	2'16	32	2'64	18	2'42	{ Subsequent fate not reported
138	20'66	100	21'89	258	21'29	148	19'77	
25	3'74	17	3'68	65	5'36	31	4'17	Total
2	0'30	3	0'73	3	0'25	7	0'91	
165	24'70	120	26'30	326	26'90	186	24'85	6. Capture
—	—	—	—	—	—	—	—	7. Piracy
14	2'09	14	3'02	35	2'89	17	2'21	8. Burnt or on fire
1	0'15	3	0'63	5	0'41	8	1'10	9. Dismasted or disabled
10	1'49	8	1'66	38	3'14	11	1'50	{ 10. Jettison of cargo under deck
6	0'90	2	0'55	17	1'40	12	1'62	
21	3'14	9	1'94	25	2'06	16	2'17	{ 11. Jettison of deckload or washed overboard
7	1'05	3	0'69	13	1'07	10	1'32	
141	21'11	92	20'26	234	19'31	123	16'33	{ 12. Leaky
1	0'15	5	1'07	2	0'16	5	0'69	
77	11'53	30	6'69	180	15'59	115	15'32	{ 13. Loss of anchors or chains
—	—	—	—	—	—	—	—	
668	—	455	—	1,212	—	750	—	{ 14. Machinery damaged or short of coals
667	—	444	—	1,178	—	729	—	
Number of casualties								Number of steamers
Number of steamers								

5.—*A Table showing the Results of Wrecks and Casualties to Ship and to Cargo, with List," during the Four Quarters of 1882, and the respective Percentages thereon, Previous Years.*

	Sailing Vessels.							
	First Quarter.				Second Quarter.			
	1882.		Average Sixteen previous Years.		1882.		Average Sixteen previous Years.	
	Number	Per Cent.	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.
<i>Results to Ship—</i>								
Total loss	441	18.52	497	17.72	361	19.47	327	19.33
Constructive loss	30	1.26	49	1.77	21	1.13	35	2.06
Great damage.....	190	7.98	292	10.41	159	8.58	175	10.34
Minor damage	1,185	49.77	1,380	49.23	891	48.06	740	43.75
Raised after sinking	16	0.67	12	0.45	15	0.81	9	0.57
Not damaged or results } unknown.....	519	21.80	573	20.42	407	21.95	405	23.95
Total	2,381	—	2,804	—	1,854	—	1,691	—
<i>Results to Cargo so far as reported—</i>								
All lost	218	9.16	284	10.15	148	7.98	168	9.92
Part lost	158	6.64	146	5.22	99	5.34	86	5.10
All saved.....	6	0.25	11	0.40	3	0.16	5	0.31
Forwarded	4	0.17	9	0.33	1	0.05	5	0.32
Heated	5	0.21	6	0.22	1	0.05	3	0.16
Shifted	27	1.13	40	1.43	22	1.19	1	1.12
Otherwise damaged	43	1.86	50	1.78	63	3.40	19	2.03
Salvage services	126	5.29	272	9.71	113	6.09	144	8.52
<i>Lives—</i>								
Crews saved	231	9.70	274	9.77	241	13.00	168	9.93
Crews drowned	73	3.07	32	1.13	26	1.40	23	1.36
Lives lost so far as reported (in both ships and steamers).....	399	—	474	—	431	—	485	—

Salvage Services, Crews Saved or Drowned and Lives Lost, so far as reported in "Lloyd's Compared with the Average Number and Percentages for the same period of the Sixteen

Sailing Vessels.								
Third Quarter.				Fourth Quarter.				
1882.		Average Sixteen previous Years.		1882.		Average Sixteen previous Years.		
Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.	
271	17'48	322	17'76	651	20'73	706	19'34	<i>Results to Ship—</i>
22	1'42	36	1'99	16	0'51	40	1'09	Total loss
120	7'74	202	11'15	287	9'14	405	11'09	Constructive loss
730	47'10	801	44'17	1,469	46'78	1,716	46'99	Great damage
8	0'52	9	0'50	2	0'06	11	0'29	Minor damage
399	25'74	443	24'43	715	22'78	774	21'20	Raised after sinking
								{ Not damaged or results unknown
1,550	—	1,813	—	3,140	—	3,651	—	Total
								<i>Results to Cargo so far as reported—</i>
117	7'55	155	8'55	289	9'20	334	9'14	All lost
68	4'39	85	4'66	198	6'31	221	6'05	Part lost
4	0'26	5	0'27	7	0'22	10	0'28	All saved
1	0'06	5	0'25	2	0'06	4	0'11	Forwarded
3	0'19	4	0'22	2	0'06	5	0'13	Heated
14	0'90	17	0'91	21	0'67	52	1'44	Shifted
38	2'45	35	1'92	37	0'118	43	1'17	Otherwise damaged
92	5'94	154	8'52	262	8'34	323	8'85	Salvage services
								<i>Lives—</i>
172	11'10	165	9'12	433	1'38	377	10'33	Crews saved
15	0'97	13	0'73	31	0'99	31	0'86	Crews drowned
367	—	269	—	527	—	582	—	{ Lives lost so far as reported (in both ships and steamers)

6.—*A Table showing the Results of Wrecks and Casualties to Ship and to Cargo, with List, during the Four Quarters of 1882, and the respective Percentages thereon, Previous Years.*

	Steamers.							
	First Quarter.				Second Quarter.			
	1882.		Average Sixteen previous Years.		1882.		Average Sixteen previous Years.	
	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.
<i>Results to Ship—</i>								
Total loss	70	7'03	42	7'30	53	7'17	29	7'03
Constructive loss	1	0'10	3	0'43	1	0'13	2	0'41
Great damage.....	51	5'12	35	6'16	31	4'20	27	6'51
Minor damage	493	49'50	268	46'70	388	52'50	183	44'25
Raised after sinking	6	0'60	4	0'77	5	0'68	4	0'86
Not damaged or results unknown.....	375	37'65	222	38'64	261	35'32	169	40'94
Total	996	—	575	—	739	—	414	—
<i>Results to Cargo so far as reported—</i>								
All lost	44	4'42	18	3'22	28	3'79	11	2'63
Part lost	40	4'02	27	4'64	34	4'60	21	5'13
All saved.....	1	0'20	1	0'12	—	—	1	0'14
Forwarded	—	—	1	0'10	—	—	—	—
Heated	2	0'20	1	0'13	—	—	—	—
Shifted	11	1'10	11	1'84	11	1'49	3	0'75
Otherwise damaged	29	2'91	14	2'48	24	3'25	11	2'69
Salvage services	50	5'02	42	7'37	31	4'20	37	9'03
<i>Lives—</i>								
Crews saved	33	3'31	21	3'72	33	4'46	15	3'56
Crews drowned	15	1'51	4	0'75	5	0'68	2	0'38
Lives lost so far as reported in both ships and steamers (see Sailing Vessels, <i>supra</i>) ...	—	—	—	—	—	—	—	—

Salvage Services, Crews Saved or Drowned and Lives Lost, so far as reported in "Lloyd's Compared with the Average Number and Percentages for the same period of the Sixteen

Steamers.								
Third Quarter.				Fourth Quarter.				
1882.		Average Sixteen previous Years.		1882.		Average Sixteen previous Years.		
Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.	
50	7.50	33	7.37	123	10.44	59	8.12	<i>Results to Ship—</i>
—	—	7	0.33	—	—	2	0.22	Total loss
27	4.05	32	7.20	64	5.43	50	6.92	Constructive loss
322	48.27	188	42.30	555	47.11	321	44.03	Great damage
1	0.15	3	0.73	5	0.43	6	0.78	Minor damage
267	40.03	187	42.07	431	36.59	291	39.93	Raised after sinking
667	—	444	—	1,178	—	729	—	{ Not damaged or results unknown
								Total
16	2.40	13	2.92	36	3.06	21	2.91	<i>Results to Cargo so far as reported—</i>
26	3.70	20	4.39	74	6.28	37	5.03	All lost
1	0.15	—	—	—	—	1	1.15	Part lost
—	—	1	0.11	—	—	—	—	All saved
1	0.15	1	0.14	—	—	1	0.08	Forwarded
3	0.45	3	0.69	22	1.87	15	2.12	Heated
28	4.20	12	2.74	34	2.89	21	2.82	Shifted
23	3.45	35	7.84	79	6.71	48	6.58	Otherwise damaged
								Salvage services
15	2.25	15	3.46	46	3.90	25	3.46	<i>Lives—</i>
2	0.30	1	0.11	8	0.68	3	0.37	Crews saved
—	—	—	—	—	—	—	—	Crews drowned
								{ Lives lost so far as reported in both ships and steamers (see Sailing Vessels, <i>supra</i>)

IV.—*Emigration and Immigration in the Year 1882.*

THE following is a copy of Mr. Giffen's report to the Secretary of the Board of Trade, on the "Statistical Tables relating to Emigration and Immigration from and into the United Kingdom in the year 1882:—

"Sir,—In submitting the annexed tables relating to emigration and immigration from and into the United Kingdom for the year 1882, with comparative tables for a series of years past, I beg leave to call attention at the outset to the magnitude of the emigration. For the last three years the figures have been very large, but the year 1882 shows the largest total yet recorded. The increase in 1882, it will also be seen, is mainly in the emigration of persons of British and Irish origin, the foreigners emigrating being less than in the previous year. While, therefore, the total emigration in 1882 was larger than in any previous year, the increase in the case of persons of British and Irish origin only was even more striking than the increase of the total emigration.

"The figures as to the increase of emigration alone, without taking into account the immigration, are as follows:—

(a.) *Increase of Emigration.*

	Total, including Foreigners.	Emigrants, of British and Irish Origin only.
Number of emigrants in 1882	413,288	279,366
" '81	392,514	243,002
Increase	20,774	36,364

"Thus the total number of emigrants, including foreigners, amounted last year to 413,288, an increase of 20,774, as compared with 1881. In this total again, the number of emigrants of British and Irish origin only was 279,366, an increase of 36,364 compared with 1881. It was noticed in last year's report that the emigration of persons of British and Irish origin only in 1881 was somewhat higher than the highest year of the previous decade, viz., 1873, when the figure 228,345 was reached, and had only been exceeded in two years since 1853, these years being 1853 and 1854, when the corresponding figures were 278,129 and 267,047. It will now be observed that the figure of 1882, viz., 279,366, is absolutely the largest in any one year since 1853, when the nationality of emigrants began to be distinguished. In proportion to the population, the emigration is less important than it was thirty years ago, but the actual numbers are larger than they were then. The character of the emigration, as will afterwards be seen, has changed, being now much more largely English and Scotch, and less Irish, than it was thirty years ago; but I am only noticing at present the general totals as they affect the whole of the United Kingdom.

"It follows from the above figures that the number of foreign

emigrants passing through the United Kingdom in 1882 must have diminished, as compared with 1881, by about 15,000. The total increase being 20,774, and the increase of emigrants of British and Irish origin only being 36,364, the difference, which is about 15,000, represents a decrease of foreign emigration. Whether the number of emigrants from Europe to the United States has correspondingly diminished, I have not the means of saying, the foreign statistics on this point not yet being available, but it appears not improbable, looking at the United States' returns of immigration, that the falling off implies rather a change in the route of the European emigration than any falling off in its amount. In this connection it may also be observed that the present returns, which merely deal with passengers to places out of Europe, as explained in former reports, do not include a certain number of emigrants from the United Kingdom who take their passage to continental ports and thence proceed by shipping from those ports to the United States. I have ascertained, upon inquiry, that last year about 5,000 persons proceeded from the United Kingdom to the Continent and were thence shipped in foreign vessels as emigrants to the United States.* The numbers are as yet too small to affect the general totals of this return, but if they should increase, it would be necessary to take some steps to include them in the return, although the passengers in question are not emigrants coming under the Passenger Acts, the working of which it was the original object of these returns to illustrate.

"The facts as to the increase of immigration have next to be noticed. These are:—

(b.) *Increase of Immigration.*

	Total, including Foreigners.	Immigrants of British and Irish Origin only.
Number of immigrants in 1882	78,268	50,599
" '81	77,105	52,707
Increase	1,163	2,108†

† Decrease.

* "The following table gives the number of emigrants of British and Irish nationality who proceeded by this route to America:—

	Adults.				Children under 12 Years of Age and Infants.		Total.	
	Married.		Single.					
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
English	901	363	1,737	281	412	452	3,050	1,096
Scotch	104	50	207	41	30	27	341	118
Irish	27	22	58	33	24	27	109	82
Total of British origin.....	1,032	435	2,002	355	466	506	3,500	1,296

"According to these figures, the immigration in 1882 was much the same as in the previous year. There has thus been no distinct sign as yet of a decrease in the emigration movement, which would be denoted by a rapid increase in the immigration. There is an increase in the emigration itself, up to the latest moment, and there is hardly any sign as yet of the immigrants coming back in greater numbers, which would, according to former experience, be a symptom of an approaching decline in the emigration itself. As will be seen below, contrary to what took place in 1881, there is a large increase in the excess of British emigrants over immigrants in 1882.

"These facts as to the excess of emigrants have next to be stated. They are:—

(c.) *Increase of Excess of Emigrants.*

	Total Emigration and Immigration.	Emigration and Immigration of Persons of British and Irish Origin only.
Number of emigrants in 1882.....	413,288	279,366
„ immigrants '82.....	78,268	50,599
Excess of emigrants	335,020	228,767
Corresponding excess in 1881	315,409	190,295
„ '80	263,978	180,535
„ '79	163,190	126,338
„ '78	69,712	57,958
„ '77	38,123	31,305
„ '76	44,665	38,065

"From this it appears that the excess of emigrants last year, whether we compare the total emigration and immigration, or the emigration and immigration of persons of British and Irish origin only, was unprecedentedly large. The excess of total emigrants is 335,000, or very nearly 1,000 per day, and the excess of emigrants of British and Irish origin only is 228,767, which is 38,000 more than in the previous year, and enormously greater than the figures in some of the years before that, when a correct balance between emigrants and immigrants in this form was first struck. As was remarked in last year's report, it is impossible to carry the comparison further back than 1876, but there can be little doubt that the above excess of emigrants was probably as large as in any year since 1853 and 1854, if not larger. The loss of population to the United Kingdom last year was very large indeed, being very nearly one-half the total excess of births over deaths.

"As already noticed also, the loss must be more largely than it was thirty years ago, a loss of English and Scotch as distinguished from Irish population. The Irish emigration continues large in proportion to the population of Ireland, but the amount is smaller than it was thirty years ago, while the amounts in the case of the English and Scotch population have increased. Last year, as will

be noticed specially afterwards, the Irish emigration, contrary to what had occurred the previous year, increased, though it did not quite reach the large total of 1880.

"The coincidence of a large emigration with a revival of trade succeeding a prolonged period of depression has been fully noticed in former reports. Towards the end of last year trade in this country appeared to have lost a little of the impetus given to it two years before, and it does not generally at the present time appear to be so brisk as it was. It remains to be seen, therefore, whether this check to the revival which was in progress will be sufficient to produce any decline in emigration itself, such as former experience might lead us to expect. It is too early yet in the present year to draw any inferences from the facts as to the present year's emigration which have yet become known.

"As regards the destination of the emigrants, it has to be noticed that, contrary to what has been the experience until now, the increase is not so marked in the numbers going to the United States as it is in the numbers going to other places. While the increase last year, compared with 1881, in the excess of emigrants to the United States among persons of British and Irish origin is 7,000 only, it is found that the increase in the excess of emigrants to British North America is no less than 16,000, and to Australasia about 14,000. The facts are exhibited in the following table:—

Destinations of Excess of Emigrants over Immigrants among Persons of British and Irish Origin only in the Undermentioned Years.

Country of Emigration and Immigration.	Excess of Emigrants in						
	1876.	1877.	1878.	1879.	1880.	1881.	1882.
United States.....	(-) 143*	603	20,654	71,758	140,052	146,323	153,435
British N. America....	2,706	2,033	4,448	14,455	16,214	18,151	34,344
Australasia	29,617	25,501	32,272	35,992	18,274	16,805	31,465
All other parts	5,885	3,168	584	4,133	5,995	9,016	9,543
Total	38,065	31,305	57,958	126,338	180,535	190,295	228,767

* Excess of immigrants.

"The great increase in the emigration to British North America thus shown would seem to be due in some measure to the special attractiveness of the north-western provinces of Canada, and the great efforts made by the Canadian Government to have these provinces settled. The United States still receives much the largest share of the emigration to North America, but the deviation of the current last year to British North America appears to be important, and significant, perhaps, of a permanent change. The increase to Australasia is not improbably due to the renewed efforts of the Colonial Governments there to obtain immigrants. The direction of the stream of emigration to Australasia by this means has frequently been noticed before, the Colonial Governments there finding it expedient to give special assistance to emigrants, and

the number of emigrants they receive varying with the amount of assistance they give. There is, again, a noticeable increase in the excess of emigrants 'to all other parts,' which continues to be accounted for mainly by an increase of passengers to the Cape of Good Hope and Natal. The figures are still small, however, compared with the number of emigrants to the United States, to British North America, and to Australasia.

"The following summary table, showing the numbers of cabin and steerage passengers included in the tables of emigration, is continued from former reports. The increase in 1882, it will be observed, as has been the case for several years past, is almost entirely in steerage passengers, an obvious indication of the real nature of the passenger movement of recent years:—

Numbers of Cabin and Steerage Passengers leaving the United Kingdom for Places out of Europe, in each of the Years from 1876 to 1882 inclusive.

Years.	Cabin Passengers.	Steerage Passengers.	Total.
1876	41,900	96,322	138,222
'77	37,147	82,824	119,971
'78	43,168	104,495	147,663
'79	43,928	173,235	217,163
'80	50,734	281,560	332,294
'81	54,270	338,244	392,514
'82	56,739	356,549	413,288

"Coming now to the question of the proportion of English, Scotch, and Irish persons in the total emigration of persons belonging to the United Kingdom, I have to submit the following summary, which is continued from last year's report:—

Statement of the Number and Proportion of Persons of English, Scotch, and Irish Birth respectively, in the Total Emigration of Persons of British Origin at different Periods.

Period.	English.		Scotch.		Irish.		Total.
	Number.	Per-centage of Total.	Number.	Per-centage of Total.	Number.	Per-centage of Total.	
Three yrs. 1853-55	211,013	30	62,514	9	421,672	61	695,199
Five years '56-60	243,409	39	59,016	10	315,059	51	617,484
" '61-65	236,838	33	62,461	9	418,497	58	717,796
" '66-70	368,327	43	85,621	10	400,085	47	854,033
" '71-75	545,015	56	95,055	10	329,467	34	969,537
Year 1876	73,396	67	10,097	9	25,976	24	109,469
" '77	63,711	67	8,653	9	22,831	24	95,195
" '78	72,323	64	11,087	10	29,492	26	112,902
" '79	101,275	64	18,703	11	41,296	25	164,274
" '80	111,845	49	22,056	10	93,641	41	227,542
" '81	139,976	58	26,826	11	76,200	31	243,002
" '82	162,992	58	32,242	12	84,132	30	279,366

“From this it appears that while the number of Irish persons emigrating, which showed a decline of about 17,000 in 1881 from the large total of 93,000 in 1880, increased last year to 84,000, yet the proportion of Irish to the total emigration from the United Kingdom is rather less than it was in 1881, being nearly 30 as compared with 31 per cent.; it appears, in fact, that the increased emigration of persons of English origin amounts to 23,000, the total being 163,000, and the increased emigration of persons of Scotch origin is about 5,400, the total being 32,000, so that last year there were about 195,000 English and Scotch persons emigrating as compared with 84,000 Irish. The circumstances promoting emigration from the United Kingdom must thus be considered to have been very general, and not very specially connected with the condition of Ireland. The sudden increase of Irish emigration in 1880 remains an exceptional phenomenon, but the total which has been reached in 1882 may be considered as in correspondence with the general figures of the emigration from the United Kingdom.

“While the Irish emigration has thus come to be due to much the same causes as that of the rest of the United Kingdom, though it is somewhat larger in proportion to the population, it would appear from a new comparative table which has been prepared, and which is inserted in the Appendix to the present report (*see* Table XV, annexed), that there are interesting differences between it and the English and Scotch emigration in regard, first, to the proportion of the adult single female emigration to the total number of single adults emigrating, and, second, to the proportion of the number of children to the total emigrants. Both in the English and Scotch emigration the excess of males over females among the single adults emigrating is very large. Among the English emigrants in 1882 there were 63,992 adult single males, as compared with 22,519 adult single females, the excess being no less than 41,473, or nearly twice the number of adult single females emigrating. In the recent years of high emigration also, it will be seen, the proportions were much the same, the excess of adult single males over adult single females emigrating, being about twice the number of the females. In 1879 the excess was nearly three times the number of females. The figures as to the Scotch emigration are also much the same. The adult single male emigrants in 1882 of Scotch origin were 13,451, the adult single female emigrants 4,857, and the excess of males over females 8,594. When we come, however, to the Irish emigration, we find that the adult single male emigrants in 1882 were 34,937, and the adult single female emigrants were 28,605, the excess of males over females being thus 6,332 only, or less than a fourth of the number of females; similarly, in 1881 and 1880, the number of adult single female emigrants was 26,644 and 33,269 respectively, the excess of males over females being in each case about 4,600 only. It is plain from these figures, therefore, that while of the number of single adults in the case of English and Scotch emigrants much the largest proportion are males, the proportions of the two sexes among the single adults are very nearly equal in the case of the Irish emigration. The inference would seem to be that there must be special

causes attracting female emigrants of Irish origin abroad, while the effect on the Irish population at home must undoubtedly be to prevent so large a proportionate excess of females over males as there is in the rest of the United Kingdom. As regards children again, the facts are that while the proportion of children to total emigrants, in the case of the English emigration, is rather more than 20 per cent., and in the case of Scotch emigration is very nearly 23 per cent., it is about 13 per cent. only in the case of the Irish emigration. Of equal numbers of emigrants, therefore, it will be found that a larger proportion of Irish than of English and Scotch emigrants are adults either of marriageable age or approaching marriageable age. The result of these two differences, viz., the greater proportion of adult single females emigrating from Ireland, and the smaller proportion of children in the total emigration, cannot but be to make the Irish emigration proportionately far more effective in retarding the growth of population at home than is the English and Scotch emigration. The Irish emigration is, much more largely than the English and Scotch emigration, the emigration of people at the marriageable age, or approaching the marriageable age.

"The above facts appear to throw light on the population statistics of Ireland. According to the report on the census of Ireland for 1881, p. 15 of Part II, it appears that there has been no change since 1871 in the proportion of the population between 20 and 50 to the total population, which may be partly accounted for by the fact, that between 1870 and 1880 the emigration was comparatively small, and it was only at the close of the decade that it began to increase. But it is found on comparing the statistics of Irish population with those of England that the proportion of adults, at almost all ages between 20 and 50 in Ireland to the total population, is considerably less than in England. For the whole period of life between 20 and 50, the proportion in Ireland to the total population is about 36 per cent., while in England it is nearly 40 per cent. This may partly account for the fact of a lower birth-rate in Ireland than in England or Scotland, as well as for a smaller excess of births over deaths, the proportion of people in the prime of life being smaller in Ireland than it is either in England or Scotland. The excess of births over deaths has also of late years been very small in Ireland, and much less than it was about 1871 and 1872. In those years the excess was about 60,000, the figure in 1871 being 62,945, but since 1878 the excess has ranged between 25,000 and 35,000, viz.:—

1878	34,488	1881	35,755
'79	30,239		
'80	25,180	'82	33,978

"These facts appear to be all in accordance with those which appear on the face of the Emigration Returns themselves, and to which I have now called attention. The difference in the character of the emigration from Ireland, as compared with English and Scotch emigration, has a distinct effect upon the birth and death-rates, and the growth of population in that country.

"The question is one which belongs more properly to the statistics of emigration from Ireland, as stated in the annual return of the Irish Government, including the emigration to other parts of the United Kingdom, as well as to foreign countries; but assuming that the above figures, which are those of the Irish emigration from the United Kingdom, correspond very nearly to the emigration from Ireland, considered geographically, it is to be observed that during the last three years the amount of the emigration must have been such as to cause a real diminution in the population of Ireland. It is much larger than the excess of births over deaths in those years, as the following comparison shows:—

Comparison of Irish Emigration from the United Kingdom, with the Excess of Births over Deaths in Ireland.

Year.	Excess of Births over Deaths.	Number of Emigrants.	Diminution of Population.
1880	25,180	93,641	68,461
'81	35,755	76,200	40,445
'82	33,978	84,132	50,154

"This shows a diminution of about 160,000 in the population in three years. For several years before that the emigration was rather less than the annual excess of births over deaths, but during the last three years it may be considered that the population of Ireland has been steadily declining in consequence of the emigration.

"The usual tables are added, showing in detail the sex, age, condition, and occupations of the emigrants; the numbers departing from each of the ports of the United Kingdom; the particulars of detention money recovered by emigration officers; and the amount of remittances by settlers in the United States and British North America to friends at home; besides comparative tables. With regard to these remittances, however, I have again to repeat the remark of former reports, that the data are necessarily very incomplete."

V.—*The Annual Local Taxation Returns (England) of the Year 1880-81.*

THE following memorandum by Mr. Frederick Purdy, Principal of the Statistical Department of the Local Government Board, is taken from "the Annual Local Taxation Returns (England) for the year 1880-81:—

"1. This is the Eleventh Annual Return of local taxation which has been prepared and issued under the direction of the Local Government Board.

"2. The total raised during the year 1880-81 by local taxation was 32,434,123*l.*; the Parliamentary grants which are shown in the returns principally in aid of rates were 2,088,807*l.*

	Local Taxation.	Grants in Aid from Imperial Taxation.	Total of Taxation for Local Purposes.
	£	£	£
1. Levied by rates on rateable property	26,808,225	—	28,895,197
Parliamentary grants in aid of rates	—	2,086,972	
2. Levied by tolls, dues, and rents, on traffic	5,197,152	—	5,198,987
Parliamentary grants in aid of tolls, dues, and rents on traffic	—	1,835	
3. Levied by duties on consumable articles	428,746	—	428,746
Parliamentary grants in aid of said duties	—	—	
Total	32,434,123	2,088,807	34,522,930

"3. With reference to this table it should be remembered that the returns made to the Local Government Board do not state the whole amount voted by Parliament in aid of local taxation. The total subvention provided for England with respect to the year 1880-81, was, as shown by the estimates, 2,901,314*l.*, or upwards of 812,000*l.* beyond the sum given in the above table, which includes only the sums actually appearing in the returns of the local authorities.

"4. A summary of local rates is shown hereunder—

Local Taxation Summary, 1880-81.

Principal Source of Revenue.	Amount of Local Impost.	Other Sources, including Treasury Grants and Ordinary Loans.	Total Receipt.	Total Expenditure.	Loans Outstanding at the Close of the Respective Accounts.
	£	£	£	£	£
Table					
I. Rates	26,808,225	20,848,550	47,656,775	45,349,630	113,819,131
II. Tolls, dues, and rents }	5,197,152	1,964,197	7,161,349	6,725,454	30,516,107
III. Duties	428,746	99,761	528,507	515,791	—
Grand total	32,434,123	22,912,508	55,346,631	52,590,875	144,335,238

TABLE I.—*Rates.*

Source of Revenue.	Year of the Return.	Number of Separate Authorities Returned	Receipt.				Total Expenditure.
			Rates.	Treasury Subventions.	All other Sources, including Loans.	Total.	
			£	£	£	£	£
1. Poor rate, <i>excluding</i> precept rates paid thereout	1880-81	647 unions 14,931 parishes	7,969,845	617,631	*921,153	9,508,629	9,058,019
2. County and county police rates (less contributions to main roads)	'80-81	63	1,456,807	548,743	708,080	2,713,630	2,695,221
3. Borough and town police rates, <i>excluding</i> school board rates	'80-81	240	1,349,128	386,289	1,271,244	3,006,661	2,882,995
[See Table II]							
4. Highway rates	'79-80	424 boards 5,804 parishes	1,821,041	—	46,643	1,867,684	1,854,232
5. Metropolitan local management rate, <i>excluding</i> precept rates paid thereout	'80-81	43	1,754,341	—	488,884	2,243,225	2,173,306
6. Metropolitan Board of Works, <i>excluding</i> coal & wine duties	1880	1	620,957	10,000	2,251,205	2,882,162	3,565,436
[See Table II]							
7. Metropolitan police rate	1880-81	1	555,844	451,182	148,578	1,155,604	1,148,420
[See Table II]							
8. City of London police rate	1880	1	75,511	—	30,861	106,372	100,601
9. City of London ward rate	'80		6,142	—	—	6,142	5,615
10. Urban sanitary rates— (a) Raised by town councils	1880-81	222	6,446,051	8,283	8,149,078	14,603,412	14,518,806
(b) Raised by other sanitary authorities (inclusive of amount paid to joint boards)	'80-81	754	2,465,971	15,074	*2,361,866	4,842,911	2,984,941
[See Table II (a) and (b)]							
11. Rural sanitary rate	'80-81	577	283,896	49,285	*287,570	620,751	358,407
12. Port sanitary rate	'80-81	41	†[2,385]	485	228	3,098	6,654
13. Lighting and watching rate	'80-81	194	37,884	—	646	38,530	38,113
14. Sewers rate	'80-81	55	57,817	—	17,552	75,369	69,810
15. Drainage and embankment rate	'80-81	159	202,380	—	139,936	342,316	340,252
[See Table II]							
16. Burial board rate	'80-81	552	130,229	—	136,392	266,621	257,286
[See Table II]							
17. School board rate	'79-80	2,051	1,562,385	—	1,800,391	3,362,776	3,278,327
[See Table II]							
18. Church rate	'80-81	218	11,996	—	1,271	13,267	13,189
Total of rates	—	26,978	26,808,225	2,086,972	18,761,578	47,656,775	45,349,630

* (1) "Poor rate," as summarised above, contains in column of "All other Sources," &c., an amount of 500,280*l.* raised upon loan; the rural sanitary rate 267,773*l.*; and the urban sanitary, 10 (b), 1,771,733*l.*; otherwise the loans raised in these cases are not shown by the detailed accounts, nor does the expenditure out of loans appear in the accounts of these authorities.

† Port sanitary authority. The sum of 2,385*l.* is excluded from the total of "Rates" and of "Receipts," to avoid a duplicate reckoning of that sum.

"5. Returns of certain of the authorities who are represented in Table I are also shown in the statement hereunder, so far as their revenues arise from tolls, dues, fees, and rents:—

TABLE II.—*Tolls, Dues, Fees, and Rents.*

Source of Revenue.	Year of the Return.	Number of Separate Authorities Returned.	Receipt.				Total Expenditure.
			Tolls, Dues, Fees, and Rents.	Treasury Subventions.	All other Sources, including Loans.	Total.	
			£	£	£	£	£
19. Corporation of London	1880 } '80 }	See Table I	298,764	1,835	471,422	772,021	765,582
20. Corporation of London (Blackfriars and Clerkenwell improvements)			906	—	23,117	24,023	57,922
21. Borough tolls, dues, and rents..... [See also Table I]	1880-81	"	585,399	—	—	585,399	585,399
22. Metropolitan Board of Works	1880	"	98,977	—	—	98,977	98,977
23. Urban sanitary authorities— (a) Town Councils	1880-81	"	307,461	—	—	307,461	307,461
(b) Other sanitary authorities, including joint boards	'80-81	"	40,695	—	—	40,695	40,695
[See Table I]							
24. Metropolitan Police	'80-81	"	27,655	—	—	27,655	27,655
[See Table I]							
25. Drainage and Embankment	'80-81	"	4,626	—	—	4,626	4,626
26. Turnpike trusts	'79-80	240	237,741	—	18,074	255,815	271,880
27. Markets and fair tolls	'80-81	17	27,171	—	254	27,425	21,505
28. Bridge and ferry tolls	'80-81	37	64,714	—	1,657	66,371	55,621
29. Burial board fees	'80-81	See Table I	152,550	—	—	152,550	152,550
[See also Table I]							
30. School board fees	'79-80		372,745*	—	—	372,745	372,745
[See also Table I]							
31. Light dues	'79-80	1	422,255	—	4,733	426,988	348,426
32. Pilotage dues	1880	19†	398,606	—	2,349	400,955	400,548
33. Harbour dues	1880-81	66	2,156,887	—	1,440,756	3,597,643	3,213,862
Total of tolls, dues, and rents.....	—	380	5,197,152	1,835	1,962,362	7,161,349	6,725,454

* School board fees. The sum received for sale of books to children is included in this sum.

† Pilotage. Counting all the ports under the Trinity House of Deptford Strond, as one authority, and all those under the Trinity House of Kingston-on-Hull as one only.

"6. The only local imposts derived from duties, and which are discriminated in the local returns, are those levied by the City of London.

TABLE III.—*Duties.*

Source of Revenue.	Year of the Return.	Number of Authori- ties.	Receipt.			Total Expendi- ture.
			Duties.	All other Sources, including Loans.	Total.	
33. City of London—			£	£	£	£
Coal duty, at 9d.....	1880	1	273,197*	—	273,197	515,791*
City's coal duty, at 4d.			121,421*	—	121,421	
Wine duty			10,803	500	11,303	
City's grain duty			23,325	99,261	122,586	
Total of duties ...	—	1	428,746	99,761	528,507	515,791

* After deducting the drawback on coals, which was 57.148*l.* on the 9*d.* duty, and 25.399*l.* on the 4*d.* duty

Statement of Local Loans, with the Sums Outstanding at the Close of the Year 1880-81.

Security or Authority.	Loans Raised during the Year.	Loans Paid Off with Interest during the Year.	Loans Outstanding at the Close of the Year.
I. RATES, chiefly—	£	£	£
Poor law	500,280	416,194	5,271,303
County	307,628	386,624	2,995,311
Borough	637,818	710,920	6,495,112
Highway.....	4,990	6,464	49,580
Metropolitan Local Management	169,800	259,098	2,411,477
Metropolitan Board of Works...	1,929,251	436,533	15,245,229
Urban Sanitary—			
(a) Raised by town councils ..	5,585,404	4,783,862	53,213,834
(b) Raised by other autho- rity, including joint boards }	1,771,733	839,808	12,818,333
Rural Sanitary	267,773	66,628	1,081,056
Port ..	—	186	5,237
Sewers Commission	*	7,415	78,519
Drainage and Embankment Commission	94,466	135,899	1,535,740
Burial Board	108,447	153,354	1,717,612
School „	1,145,191	481,053	10,858,988
Church	—	7,927	41,800
Totals of I	12,522,781	8,694,965	113,819,131
II. TOLLS, DUES, and RENTS, chiefly—			
City of London	421,891	339,600	5,274,800
Turnpike Trustees	—	76,925	550,237
Bridge and Ferry Commissions..	416	6,071	210,926
Market and Fair „ ..	—	4,353	83,422
Harbour Commissions	1,286,337	1,818,975	24,396,722
Totals of II	1,708,644	2,275,924	30,516,107
III. DUTIES—			
City of London coal and grain duties	—	—	{ Included with City of London loans
Grand totals	14,231,425	10,970,889	144,335,238

* The loans in these accounts are not separated from “other sources of income.”

VI.—*Additions to the Library.**Additions to the Library during the Quarter ended 30th June, 1883.*

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HUNGARY—	
<i>Statistisches Jahrbuch für Ungarn, 11^{ter} Jahrgang,</i> 1881— IV Heft. Bergbau und Hüttenwesen (Mining and Smelting) VI Heft. Die Creditinstitute. (Credit Insti- tute) IX Heft. Cultus und Unterrichtswesen. (Religion and Education) XI Heft. Kriegsmacht. (Military Forces) Ungarns Waarenverkehr mit Österreich und anderen Ländern. Vom Juli, 1881, bis ende Juni, 1882. I Jahrgang. Folio. (Commerce)..	The Royal Hunga- rian Statistical Bureau, Budapest
<i>Prague—</i>	
Statistisches Handbuch der königlichen Hauptstadt Prag, für das Jahr 1881. Erster, allgemeiner Theil. Neue Folge, erster Jahrgang Deutsche Ausgabe. xiv + 220 pp., boards, 8vo. Týdení zpráva o úmrtích v Praze a obeh spojených, kteréž, jsou, &c. (Weekly Returns of Deaths)	The Statistical Bureau, Prague
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Annuaire Statistique de la Belgique, 13 ^e Année, 1882. Tome xiii. Diagrams. La. 8vo. 1883..... Exposé de la Situation du Royaume de 1861 à 1875. Vol. ii, 12 ^e Fasc. La 8vo. Statistique de la Belgique. Tableau Général du Com- merce avec les Pays Étrangers pendant l'année 1881. Diagrams, folio. 1882 Statistique Médicale de l'Armée Belge, 1875-79. xxxii + 240 pp., sm. folio. 1883 VILLE DE BRUXELLES. Bulletin Hebdomadaire de Statistique, Démographique, et Médicale. (Current numbers)	The Chief of the Statistical Bureau. Ministry of the In- terior — General Gratry, Minister of War Dr. E. Janssens, Brussels
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<i>Estadística do Commercio Marítimo do Brazil do</i> <i>Exercício de 1871-72. La. 8vo.—</i> Vol. iv. 3 ^a Parte. Commercio de longo Curso por Provincias. Continuação Vol. v. 4 ^a Parte. Vol. vi. 4 ^a Parte. Commercio Interprovincial de Cabotagem dos Generos Nacionaes	—

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Nationalökonomisk Tidsskrift, 1 ^{re} —2 ^{te} Hefte. Kjöbenhavn, 1883	The Danish Political Economy Society
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Ministère des Finances. Bulletin de Statistique et de Législation comparée. Mars—Mai, 1883	Statistical Bureau
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VILLE DE REIMS. Bulletin Mensuel du Bureau Municipal d'Hygiène. Janvier—Mai, 1883	Bureau of Hygiène
L'Economiste Français. (Current numbers.) Paris.....	
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Zeitschrift des Königlich Preussischen Statistischen Bureaus. 22 ^{ter} Jahrgang, Heft iii, iv, Juli bis December, 1882. Folio	
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Direccion de Estadística General de la República Oriental del Uruguay. Cuaderno No. XI. Poblacion y su Movimiento. Comercio exterior e interior. Navegacion. Hacienda y varios datos. Año 1879.)	—

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Proceedings of the—. No. 10, Dec. 1882; No. 1, Jan., 1883.....	
Mauritius. Almanac and Colonial Register for 1883. By John B. Kyshe. Fifteenth publication. Svo.....	The Lieut.-Governor of Mauritius
New South Wales. Census of—, 1881. Summary Tables	The Registrar-General, N. S. Wales
Queensland. Supplement to the Government Gazette, containing Vital Statistics. (Current numbers).....	The Registrar-General, Queensland
South Australia.	
Statistical Register, 1881. Contents. Part I. Population. II. Vital Statistics. III. Production. IV. Interchange. V. Law, Crime, &c. VI. Revenue and Expenditure. VII. Religious, Educational, and Charitable Institutions. Appendix. Australasian Statistics. Boards, folio. Adelaide, 1882	The Chief Secretary, Adelaide
Royal Society of South Australia. Transactions, Proceedings, and Report of the—. Vol. iv (for 1880-81). iv + 168 pp., plates, Svo. Adelaide, 1882	The Society
Tasmania. Census, 1881. Part IV. Birth Places. Part V. Conjugal Condition	E. C. Nowell, Esq., Hobart
Victoria—	
Census, 1881. Part V. Education of the People Mining Surveyors and Registrars. Reports for the quarter ended 31st December, 1882	H. H. Hayter, Esq., C.M.G.
Statistical Register of the Colony of— for 1881— Part V. Interchange	

Donations—Contd.

Donations.	By whom Presented.
Victoria—Contd.	
<i>Statistical Register of the Colony of— for 1881—Contd.</i>	
Part VI. Law, Crime, &c.	H. H. Hayter, Esq., C.M.G.
„ VII. Accumulation	
„ VIII. Production	
„ IX. Religious, Moral, and Intellectual Progress	
Statistics of Friendly Societies, for 1881	
<hr/>	
United Kingdom—	
Friendly Societies. Reports of the Chief Registrar of—, for 1881. Part I-(B), Appendix (C), Industrial and Provident Societies, No. 373-I (1882). Part I-(C), Appendix (F), Trade Unions, No. 373-II (1882)	The Chief Registrar of Friendly Societies
Mint. Thirteenth Annual Report of the Deputy Master of the—, 1882. [C-3601]	
Navigation and Shipping. Annual Statement of the—, for the year 1882. [C-3540]	The Hon. C. W. Fremantle
Statistical Abstract for the several Colonial and other Possessions in each year from 1867 to 1881. 19th number, 8vo.	
Trade and Navigation, Monthly Returns. March—May, 1883	The Board of Trade
England and Wales—	
<i>Census of—, 1881. Area, Houses, and Population—</i>	The Registrar-General of England
Vol. i, Counties	
Vol. ii, Registration Counties	
Quarterly Return of Marriages in October, November, December, 1882; and Births and Deaths in January, February, March, 1883. No. 137	
Weekly Returns of Births and Deaths in—, and in twenty-seven other large English Towns. (Current numbers)	
Annual Summary of Births and Deaths and causes of Death in— and other great Towns, 1882	
<i>City of London—</i>	
Accounts of the Chamberlain of the—, for 1879-81. Half calf, folio	The City Chamberlain
Report on the City Day-Census, 1881, by the Local Government and Taxation Committee of the Corporation. (2nd edit.) xii + 140 pp., cloth, map. 8vo.	
Ireland—	
Births and Deaths in Dublin and in fifteen of the principal Urban Sanitary Districts, Weekly Returns, with a Quarterly and Yearly Summary. (Current numbers)	The Registrar-General of Ireland
Quarterly Return of Marriages to December, 1882, and Births and Deaths to March, 1883. No. 77	
Statistical Tables of the Dublin Metropolitan Police for 1882	The Commissioner of Police, Dublin

Donations—Contd.

Donations.	By whom Presented.
Scotland—	
Twenty-fifth detailed Annual Report of the Registrar-General of Births, Deaths, and Marriages. Abstracts of 1879 [C-3557]..... Births, Deaths, and Marriages in the eight principal towns. Weekly and Monthly Returns. (Current numbers) Quarterly Return of Births, Deaths, and Marriages to 31st March, 1883. No. cxiii.....	The Registrar-General of Scotland
GLASGOW. Report on the Mitchell Library, for 1882. 8vo.	
Authors, &c.—	
BADEN-POWELL (George), M.A., F.R.A.S. State Aid and State Interference. Illustrated by Results in Commerce and Industry. xii + 284 pp., cloth, 8vo. 1882	The Author
BEETON (H. R.). Statistical Chart of British Railways, 1882	
BURDETT (Henry C.). Official Intelligence for 1883. Vol. ii, xvi + 944 pp., cloth, map, 4to.	The Managers of the Stock Exchange
CAMÁCHO (D. Juan Francisco). Memoria sobre la Hacienda Pública de España en 1881 á 1883. 510 pp., la. 8vo. Madrid	
CHALMERS (Patrick). A short Review of the Adhesive Stamp, with Resolutions of the Dundee Town Council. 35 pp., 8vo. 1883.....	"
CRAIGIE (Major). Taxation as affecting the Agricultural Interest. 40 pp., 8vo. 1878.....	
DE CANE (Sir Edmund F.), K.C.B., R.E. An Account of the manner in which Sentences of Penal Servitude are carried out in England. x + 174 pp., 8vo. 1882	"
FOSSICK'S Fifty Years' History of the Iron Trade. A Diagram, showing the production of Iron in the United Kingdom, the weight of Iron and Steel Exported, and the Prices of Typical Descriptions of Iron, &c., from 1830 to 1882	W. G. Fossick, Esq., London
GUYOT (YVES). L'Organisation Municipale de Paris et de Londres, présent et avenir. 100 pp., diagrams, sm. 8vo. Paris, 1883	
HAYTER (H. H.), C.M.G. Victorian Year Book for 1881-82 (ninth year of issue), containing numerous Tables of Comparative Statistics (Australasian and other), a Statistical Account of the Empire of Japan, Statistics of Fiji, 1878-81, &c., &c. iv + 586 pp., map, 8vo.	"
INVESTIGATOR. On the Incidence of Taxation as affecting Different Classes in the United Kingdom at the present Time. 24 pp., 8vo. 1883	
<i>Johnston (Rev. James)—</i>	"
On the "Abolition" or "Transference" of Government Colleges and High Schools in India. xii + 22 pp., 8vo. 1880.....	
On Educational Policy in India. 2nd edit., with Introduction. xviii + 61 pp., 8vo. 1880	

Donations—Contd.

Donations.	By whom Presented.
Authors, &c.—Contd.	
LEVASSEUR (E.). Précis d'Économie Politique, quatrième édition. xi + 403 pp., boards, sm. Svo. Paris 1883.....	The Author
SCOTT (BENJAMIN), F.R.A.S. A Statistical Vindication of the City of London; or Fallacies exploded and Figures explained. (3rd edit.) xv + 201 pp., cloth, Svo. 1877.....	
STEPHANITZ (ALEXANDER). Russische Eisenbahn-Werthpapiere. Ein Nachschlagebuch über die finanzielle Lage aller russischen Eisenbahn-Gesellschaften deren Betriebs-Resultate, Vertheilung der Einnahmen, Statuten, &c., für die Jahre 1874-81, nach officiellen quellen. (Russian Railway Funds.) 148 pp., cloth, la. Svo. St. Petersburg, 1883	T. Notthafft, Esq.
STRACHAN (T. Y.). The Presbyterian Church of England Ministers' Widows' and Orphans' Fund. Report and Valuation as at 31st December, 1881. 16 pp., Svo. Newcastle-on-Tyne	The Author
WALFORD (CORNELIUS), F.I.A. The Commercial Greatness of Liverpool. A Review of the Causes which have contributed to the Commercial Greatness of Liverpool. 39 pp., Svo. 1883	
Societies, &c.—	
Bankers. Journal of the Institute of—. Vol. iv, Parts V—VI. 1883	The Institute
British Association for the Advancement of Science. Report of the Fifty-second Meeting of the— held at Southampton in August, 1882. lxxviii + 716 + 94 pp., cloth, plates, diagrams	
British Iron Trade Association. Annual Report to the Members of the—, on the Iron, Steel, and Allied Trades, for 1882. vi + 155 pp., Svo.	J. S. Jeans, Esq.
Cobden Club. The Reform of the English Land System. By the Hon. George C. Broderick. 28 pp., sm. Svo. 1883.....	The Club
London Chamber of Commerce. Journal of the—. Vol. ii, Nos. 11—16. 1883	
National Association for the Promotion of Social Science—	The Chamber
Journal of the—. Vol. i, 1865-66. 747 pp., half calf, Svo.	
Sessional Proceedings, 1865-66, 1872-73. Several odd numbers.....	T. Beggs, Esq.
Transactions at Nottingham, 1882. lix + 660 pp., cloth, Svo.....	The Association
Political Economy Club. Minutes of Proceedings, 1821-82, Roll of Members, and Questions Discussed. Vol. iv. 378 pp., cloth, portrait, Svo.	
	The Committee of the Club

JOURNAL OF THE STATISTICAL SOCIETY,

SEPTEMBER, 1883.

REPORT of the COUNCIL for the FINANCIAL YEAR ended 31st December, 1882, and for the SESSIONAL YEAR ending 26th June, 1883, presented at the FORTY-NINTH ANNIVERSARY MEETING of the STATISTICAL SOCIETY, held at the Society's Rooms, Somerset House Terrace (King's College Entrance), Strand, London, on the 26th of June, 1883.

The PRESIDENT, ROBERT GIFFEN, ESQ., LL.D., in the Chair.

THE circular convening the meeting having been read, and the minutes of the last ordinary meeting read and confirmed, the following report was read:—

Report of the Council.

The Council have the honour to submit their forty-ninth annual report.

The results compare as follows with the average of the previous ten years:—

Particulars.	1882.	Average for the Previous Ten Years.
Number of Fellows on 31st December	786	662
Life Members included in the above	135	100
Number lost by death, withdrawal or default	63	41
New Fellows elected	42	77

Since the 1st of January last twenty-eight new Fellows have been elected.

The financial condition of the Society continues to be satisfactory. The following table gives, for purposes of comparison, the different sources of ordinary income for the year 1882, together with the same particulars for the previous five years :—

Receipts per	1882.	1881.	1880.	1879.	1878.	1877.	Average for the Five Years previous to 1882.
	£	£	£	£	£	£	£
Dividends	94	88	75	65	55	41	65
Annual Subscriptions....	1,291	1,306	1,317	1,300	1,197	1,117	1,247
Compositions	189	84	273	126	294	252	206
Journal sales	227	145	202	176	169	151	169
Advertisements in } Journal	37	26	35	31	17	36	29
Receipts from all } sources	1,838	1,649	1,902	1,698	1,732	1,597	1,716

The investments of the Society at the present time are increased to 3,500*l.* of New Three per Cents, as compared with 3,200*l.* a year ago.

A comparison of the principal figures at intervals of ten years in the following table, will show the progress of the Society from an early date :—

Comparison of Condition of Society at Intervals of Ten Years, on 31st December.

Year.	Number of Fellows.	Ordinary Income.	Expenditure.	Amount Invested.	Liabilities.	Assets over Liabilities.
		£	£	£	£	£
1842	429	783	814	867	164	951
'52	396	808	830	867	325	665
'62	368	770	763	867	101	1,719
'72	454	1,112	806	1,322	135	2,357
'82	786	1,838	1,581	3,071	203	5,240

The following table gives the particulars for each year of the last decade :—

Year.	Number of Fellows.	Income.	Expenditure.	Amount Invested.	Liabilities.	Assets over Liabilities.	Year.
		£	£	£	£	£	
1873	530	1,248	1,097	1,507	135	2,643	1873
'74	588	1,377	1,491*	1,507	460	2,819	'74
'75	607	1,231	1,733*	1,207	216	2,351	'75
'76	611	1,438	1,340*	1,207	187	3,464	'76
'77	683	1,597	1,286	1,398	201	3,763	'77
'78	746	1,732	1,345	1,902	168	4,147	'78
'79 ...	783	1,698	1,427	2,283	238	4,433	'79
'80	808	1,902	1,517†	2,572	214	4,614	'80
'81	807	1,649	1,400	2,869	192	4,935	'81
'82	786	1,838	1,581‡	3,071	203	5,240	'82

* The expenditure of these years was affected by the heavy expenses incident to moving into new premises.

† The expenditure of this year was affected by the expenses attending the alteration and redecoration of the meeting room.

‡ The expenditure this year is affected by the expenses attending the preparation of a new catalogue to the library.

The amount realised in 1882 by "*Journal* sales," as already shown, was 227*l.* being in excess of that for any previous year.

The decennial averages of the annual sales of the Society's *Journal* are as follows:—

For the ten years 1841-50	£56
" '51-60	83
" '61-70	97
" '71-80	155
For the last two years '81-82	186

The Opening Address of the President was given on the re-assembling of the Society in November, and the papers read and the members elected at each of the monthly meetings were as follows:—

SESSION 1882-83.

First Ordinary Meeting, Tuesday, 21st November, 1882.

The President, ROBERT GIFFEN, Esq., in the Chair.

The following were elected Fellows:—

A. Gallenga.	Benjamin Smily Essex.
Charles Cowen.	Patrick McGuire, C.E.
George Blundell Longstaff, M.A., M.B.	John Burgess.
J. H. Whadcoat.	J. T. Medhurst, C.E., A.K.C.

Edward D. De Stern.

The President delivered an Inaugural Address, on “The Utility of Common Statistics,” and presented the “Howard Medal” of 1882 (with 20*l.*) to

D. MANSON FRASER, Esq., M.A., M.D.,

for his Essay on

“The State of the Prisons of England and Wales in the Eighteenth Century, and its Influence on the Severity and Spread of Small Pox among the English Population at that Period. The Essays also to present a Comparison of the Mortality by Small Pox among the Prison Population of England and Wales during the Eighteenth Century, with the Mortality from the same cause among the Prison Population during the last Twenty Years.”

Second Ordinary Meeting, Tuesday, 19th December, 1882.

The President, ROBERT GIFFEN, Esq., in the Chair.

The following were elected Fellows:—

Nevile Lubbock.	D. Manson Fraser, M.A., M.D.
John Hamilton.	Alexander McRosty.
John James Hamilton.	Frederick Harris.
Joseph Abbott, L.D.S., R.C.S.	

Mr. C. Walford read a Paper, “A Statistical Chronology of Plagues and Pestilences as affecting Human, Animal, and Vegetable Life, with an Inquiry into their Causes.”

Third Ordinary Meeting, Tuesday, 16th January, 1883.

The President, ROBERT GIFFEN, Esq., in the Chair.

The following were elected Fellows:—

Mrs. Elizabeth Newmarch.	Henry Lee, M.P.
Francis Buller Howell.	

Major P. G. Craigie read a Paper on “Statistics of Agricultural Production.”

Fourth Ordinary Meeting, Tuesday, 20th February, 1883.

The President, ROBERT GIFFEN, Esq., in the Chair.

The following were elected Fellows:—

Thomas Walter Barron, M.A., M.B., M.R.C.S.	The Right Hon. the Earl of Harrowby. Alfred Lefeaux.
The Hon. Donald A. Smith.	Henry Freeman Hewlings.
John Neville Keynes, M.A., B.Sc.	Thomas Shelford.
E. Woodley Smith.	

Mr. Arthur Ellis read a Paper on “The Parliamentary Representation of the Metropolitan, Agricultural, and Manufacturing Divisions of the United Kingdom: with Suggestions for its Redistribution.”

Fifth Ordinary Meeting, Tuesday, 20th March, 1883.

The President, ROBERT GIFFEN, Esq., in the Chair.

The following were elected Fellows:—

Dr. Samuel Schidrowitz.	|	Samuel Smith, M.P.
Henry William Kent Roscoe.	|	Joseph Robert Carter.
Henry James Morgan.		

Rev. James Johnston read a Paper on “Education in India, and the India Commission on Education.”

Sixth Ordinary Meeting, Tuesday, 17th April, 1883.

The President, ROBERT GIFFEN, Esq., in the Chair.

The following were elected Fellows:—

Robert Thubron.	|	Rev. William Cunningham, M.A.
Francis Ysidro Edgworth, M.A.		

Mr. N. A. Humphreys read a Paper on “The Recent Decline in the English Death-Rate, and its Effect upon the Duration of Life.”

Seventh Ordinary Meeting, Tuesday, 22nd May, 1883.

The President, ROBERT GIFFEN, Esq., in the Chair.

The following were elected Fellows:—

Henry Beaumont.	|	Alfred Joseph Alexander.
Henry Jackson Moore.	|	John Scott Keltie.
Frank Stone.		

Mr. Rowland Hamilton read a Paper on “Popular Education in England and Wales, before and after the Elementary Education Act of 1870.”

Eighth Ordinary Meeting, Tuesday, 19th June, 1883.

The President, ROBERT GIFFEN, Esq., in the Chair.

The following were elected Fellows:—

E. C. Buck.

T. Wilkinson Watson.

Rev. Daniel Ace, D.D., F.R.A.S.

Richard A. Hunt, A.I.A.

Mr. Stephen Bourne read a Paper on “Food Products and their International Distribution.”

The Council regret to have to report a decrease of twenty-one in the number of Fellows of the Society; while fully aware of the competition caused by the multiplication of societies of a kindred nature, they cannot but think that the Statistical Society should at least be able to maintain its ground; they earnestly hope that the best exertions of its members will be devoted to restoring the numerical strength of the Society, and subsequently increasing it.

The improvements in the Society's rooms referred to in the last report, were felt to be still inadequate to the requirements of the evening meetings, and the House Accommodation Committee was reappointed to consider what steps were practicable.

Communications were made to the Committee of the Council on Education, with the result that permission was obtained to use the Theatre of the Royal School of Mines in Jermyn Street for the ordinary evening meetings, and the Society met there for the first time in February; on which occasion the President proposed, and the meeting expressed, a hearty vote of thanks to the Council on Education, and especially to its Vice-President, the Right Hon. A. J. Mundella, M.P., for their courtesy in permitting the Society to use the theatre. This permission is granted for the year only, and application will have to be made for its renewal from year to year; your Council have reason to believe that this will readily be granted.

The Society has been favoured with valuable papers at the ordinary evening meetings, and the Council think that the considerable increase in the receipts under the head of “*Journal sales*,” may be accepted as evidence that the contents of the *Journal* show no falling off in interest or importance.

Satisfactory progress has been made in the compilation of the new library catalogue, a portion of which is already in the press; the Library Committee are anxious that the work should in every way be well done, and have endeavoured to make both the general catalogue and the subject-index as convenient for reference as possible. The labour consequent on the system adopted has been very considerable, but the Council hope that the new catalogue will be in the hands of the Society during the present year.

As the new library catalogue will include the titles of all the Papers read before the Society and published in the *Journal*, the publication of a complete index to the latter has been postponed for the present; and the question as to the more frequent publication of the *Journal* having again been before the Council, has been referred to a committee, consisting of Mr. Stephen Bourne, Sir James Caird, Mr. Hyde Clarke, Major Craigie, Mr. Wynnard Hooper, Professor Leone Levi, Mr. Neison, Sir Rawson W. Rawson, and the Executive Committee.

In order to obviate some of the inconveniences which arise from the annual retirement from the Council of six of its members, an alteration has been made in Rule XII, under which, as amended, the Trustees of the Society become *ex-officio* members of the Council; in this way the Society will be able to retain on its list of officials the names of those whose valued services would otherwise be lost to it.

The Council, in the name of the Society, authorised a contribution of twenty guineas to the Newmarch Memorial Fund; and the Society will be interested to know that the Trustees of the Fund have made arrangements for handing over to the University College, London, the invested capital of the fund, which will endow with sixty pounds per annum their Professorship of Political Economy; it being provided that the Professorship shall henceforth be identified with the name of Mr. Newmarch, and that not less than six lectures annually be given by the Newmarch Professor on Political Economy as illustrated by Statistics.

The Council have to record their appreciation of the liberality of Mrs. Newmarch, the widow of Mr. William Newmarch, who has kindly placed at the immediate disposal of the Society a valuable collection of statistical works, which she intends to bequeath to the Society as a memorial of her late husband. These books, amounting to some eight hundred volumes, and contained in a handsome case (which, together with a portrait of Mr. Newmarch, has kindly been presented to the Society by Mrs. Newmarch), have been placed in the Council Room, and a suitable book-plate has been inserted in each volume, commemorative of the origin of the gift.

The Council have again to deplore the heavy loss which the Society has sustained through the death of some of its most distinguished members, among whom are two original members, Mr. George Warde Norman, and the Earl of Harrowby. The accidental and premature death of Professor Jevons, and the more recent decease, at an advanced age, of Dr. Farr, are a subject of keen regret to the Council, a regret which they feel assured will be felt by the Society generally. The sense entertained by the Council of the services rendered to the Society by these distinguished men has been specially recorded in the minutes.

In view of the approaching Fiftieth Anniversary of the Society, a Committee, consisting of Mr. Hyde Clarke, Mr. Heywood, Mr. Hendriks, Professor Leone Levi, Sir Rawson W. Rawson, Mr. Price Williams, and the Executive Committee, has been formed to consider in what manner the jubilee of the Statistical Society may be utilised for the advancement of statistical science and the extension of the Statistical Society; and also to consider whether it will be expedient to solicit the co-operation of Her Majesty's Government with a view of securing the attendance of foreign delegates at the same.

The Council have much pleasure in calling attention to the satisfactory financial condition of the Society, and owe their thanks to the Auditors for their services.

The Society was well represented by its Fellows at the Meeting of the British Association at Southampton, in August, 1882, and also at the Meeting of the National Association for the Promotion of Social Science at Nottingham, in September.

The subject for Essays in competition for the Howard Medal of 1884 (with 20*l.* added), is to be—

“The Preservation of Health, as it is affected by personal habits, such as Cleanliness, Temperance, &c.” (The candidates to be referred to Howard's account of his own habits, as well as to his opinions, as set forth in the text and foot notes of his two works on “Prisons” and “Lazarettos.”)

The Society has to lament the deaths of the following members of the Society:—

Fellows.

Col. J. T. Smith, F.R.S.

Peter Kennedy.

Sir S. H. Dyer, Bart.

(*c*) Prof. W. S. Jevons, F.R.S.

Geo. Warde Norman. (*Original Member.*)

(*c*) Charles Jellicoe.

(*c*) Right Hon. The Earl of Harrowby. (*Original Member.*)

Frederick Martin.

H. F. B. Ansell.

W. W. Watson.

James White.

J. Lovegrove.

David MacLagan.

Honorary Members.

M. Le Play, of Paris.

M. X. Heuschling, of Brussels.

(*c*) Indicates those who on one or more occasions had served on the Council.

The following list of Fellows proposed as President, Council, and Officers of the Society for the Session 1883-84, is submitted for the consideration of the meeting:—

COUNCIL AND OFFICERS FOR 1883-84.

PRESIDENT.

ROBERT GIFFEN, ESQ.

COUNCIL.

George S. Baden-Powell, M.A., F.R.A.S.*	Frederick Hendriks.
Arthur H. Bailey, F.I.A.	Noel A. Humphreys.
T. Graham Balfour, M.D., F.R.S.	Wynnard Hooper.
Alfred Edmund Bateman.	Frederick Halsey Janson, F.L.S.*
Stephen Bourne.	Robert Lawson.
J. Oldfield Chalwick, F.R.G.S.	Professor Leone Levi, LL.D.
Hammond Chubb, B.A.	John Biddulph Martin, M.A.
Hyde Clarke.	Richard Biddulph Martin, M.P.
Lionel Louis Cohen.	Francis G. P. Neison.
Major Patrick George Craigie.	Evan C. Nepean.
Thomas Henry Farrer.*	Henry Davis Pochin.*
Professor H. S. Foxwell, M.A.*	Sir Rawson W. Rawson, K.C.M.G., C.B.
John Glover.*	Sir W. Rose Robinson, K.C.S.I.
Rowland Hamilton.	Richard Denny Umlin.
Alfred Spalding Harvey, B.A.	R. Price Williams, C.E.

Those marked * are new Members of Council.

TREASURER.

Richard Biddulph Martin, M.P.

SECRETARIES.

Hammond Chubb. | John Biddulph Martin, M.A.
A. E. Bateman.

FOREIGN SECRETARY.

John Biddulph Martin, M.A.

The abstract of receipts and payments, and the balance sheet of assets and liabilities on 31st December, 1882, are subjoined, together with the report of the Auditors on the accounts for the year 1882:—

(I).—ABSTRACT of RECEIPTS and PAYMENTS for the YEAR ending
31st DECEMBER, 1882.

RECEIPTS.		PAYMENTS.	
	£ s. d.		£ s. d.
Balance in Bank, 31st } December, 1881 ... }	£130 17 -	Rent	£200 - -
Balance of Petty Cash. - 17 11		Less sublet	116 17 -
	131 14 11		83 3 -
Dividends on 3,200l. New 3 per } Cents	93 14 -	Salaries, Wages, and Pension	515 2 1
Subscriptions received:—		Journal, Printing	£499 7 9
40 Arrears	£84 - -	„ Annual Index	5 5 -
568 for the year } 1882	1,192 16 -	„ Shorthand } Reporters }	21 - -
7 in Advance	14 14 -	„ Literary } Services }	26 18 -
—	1,291 10 -		552 10 9
615		Advertising	73 15 10
		Ordinary Meeting Expenses	25 18 -
9 Compositions	189 - -	Library	60 8 9
Journal Sales	227 8 7	Stationery and Sundry Printing ...	65 19 1
Advertisements in Journal	37 - 3	Postage and delivery of Journals...	51 10 10
		Fire and Lights	15 16 3
Ordinary Revenue	1,970 7 9	Incidental Expenses	53 17 6
Special Gift from Mr. Pochin for } Newmarch Memorial Essay ... }	100 - -	Furniture and Repairs	40 4 5
		Howard Medal	21 10 -
		(Special Outlay) Newmarch Me- } morial Fund	21 - -
			1,580 16 6
		Purchase of 200l. New 3 per Cents	201 10 -
			£1,782 6 6
		Balance at Drum- } mond's	264 4 3
		Balance of Petty Cash	23 17 -
			288 1 3
Total	£2,070 7 9	Total	£2,070 7 9

(Signed)

“ J. O. CHADWICK,
“ G. HARVEY SIMMONDS, } *Auditors.*
“ J. WHITCHER, }

(II.)—BALANCE SHEET of ASSETS and LIABILITIES, on 31st DECEMBER, 1882.

LIABILITIES.				ASSETS.			
	£	s.	d.		£	s.	d.
Per Accounts for—				Cash Balances	288	1	3
December number } of the Journal ... }	123	10	3	3,200 <i>l.</i> New 3 per Cents, cost	3,070	18	11
Annual Index	5	5	-	Property: Estimated Value of, viz —			
Miscellaneous printing	8	8	8	Books in Library	£1,000		
Stationery, &c.	19	14	3	Journals in Stock	500		
Advertisement } Accounts	17	8	7	Furniture and Fixtures	500		
Miscellaneous (as per List).....	28	12	2	—	2,000	-	-
			202 18 11	Arrears of Subscriptions reco- verable (say)	84	-	-
Balance in favour of the Society...	5,240	1	3				
			£5,443 - 2				£5,443 - 2

(III.)—BUILDING FUND (ESTABLISHED 10th July, 1873), BALANCE SHEET,
on 31st DECEMBER, 1882.

LIABILITIES.				ASSETS.			
	£	s.	d.		£	s.	d.
Amount of Fund In- vested from last } Account	171	13	6	Invested as per last Account in Metropolitan Consolidated $3\frac{1}{2}$ per Cent. Stock, in the name of the Treasurer, R. B. Martin, Esq., M.P.—			
Balance to be Invested .	2	17	4	£167 15 2 cost	171	13	6
			174 10 10	Purchased during } the year.....	8 1 -	"	8 14 2
Dividends Received during 1882 ...			5 16 10				
			£180 7 8		£175 16 2		£180 7 8

(Signed)

" J. O. CHADWICK,
 " G. HARVEY SIMMONDS,
 " J. WHITCHER,

} *Auditors."*

“REPORT OF THE AUDITORS FOR 1882.

“STATISTICAL SOCIETY,

“23rd April, 1883.

“*The Auditors appointed to examine the Treasurer's Accounts of the Society for the Year 1882,*

“REPORT:—

“*That they have compared the Entries in the Books with the several Vouchers for the same, from the 1st January to the 31st December, 1882, and find them correct, showing the Receipts (including a Balance of 131l. 14s. 11d. from 1881) to have been 2,070l. 7s. 9d., and the Payments (including the purchase of 200l. New Three per Cents), 1,782l. 6s. 6d., leaving a Balance in favour of the Society of 288l. 1s. 3d. at 31st December, 1882. The Receipts include 100l. from H. D. Pochin, Esq., as a special gift for a “Newmarch Memorial Essay.”*

“*They have also had laid before them an Estimate of the Assets and Liabilities of the Society at the same date, the former amounting to 5,443l. —s. 2d., and the latter to 202l. 18s. 11d., leaving a Balance in favour of the Society of 5,240l. 1s. 3d.*

“*The amount standing to the credit of the Building Fund at the end of the year 1882, was 180l. 7s. 8d., invested in Metropolitan Three and a Half per Cent. Stock, in the name of the Treasurer, R. B. Martin, Esq., M.P.*

“*They further find that at the end of the year 1881 the number of Fellows on the list was 807, which number was diminished in the course of the year to the extent of 63, by Deaths, Resignations, and Defaulters, and that 41 new Members were elected, and the Resignation of one Fellow was cancelled, leaving on the list on the 31st December, 1882, 786 Fellows of the Society.*

(Signed)

“J. O. CHADWICK,

“G. HARVEY SIMMONDS,

“J. WHITCHER,

} Auditors.”

THE PRESIDENT: Gentlemen, I have now to move "that the Report of the Council, the Abstract of Receipts and Payments, the Balance Sheet of Assets and Liabilities, and the Report of the Auditors for 1882, be adopted, entered on the minutes, and printed in the *Journal*." In doing so I do not think it will be necessary for me to detain you very long with reference to the matters mentioned in the report; I think it must be considered to be in almost all respects a highly satisfactory report. In one respect indeed the statement made almost at the beginning of the report does not seem to be satisfactory, and that is that in the past year there was a slight diminution in the number of members. That undoubtedly is not satisfactory; but this is to be considered, that that diminution after all is something less than $2\frac{1}{2}$ per cent. of the total number of members, and it comes after a period in which the Society has made very rapid progress in the number of its members. If you will look at the table that gives particulars for each year of the last decade, you will find that ten years ago the number of members of the Society was only 530, and now it is 786, that is an increase of something like 50 per cent. in the ten years; and as late as 1877, or about five years ago, the number was still only about 683, so that there is an increase of about 100 members since that period. I am not saying this in any way to diminish the earnestness of members in endeavouring to obtain additions to their numbers; but the facts are those which we may fairly refer to when we notice a slight falling off in the numbers; it is not a serious or long-continued falling off, it is only one of those slight fluctuations which every society like this may expect in the course of its history. As we are now approaching the jubilee period, it is very interesting to look at the table in the report which shows what the progress of the Society has been since its commencement. Whatever opinion we may have upon the slight fluctuation which is now before us, this summary of our history for the last fifty years is highly satisfactory. It appears that as late as twenty years ago the number of members was even less than it had been in 1842, which was shortly after the foundation of the Society. The income of the Society was also less, being about 770*l.* annually, as compared with 783*l.* in 1842. But at the present date, as compared with 316 members in 1862, we have 786 members, or more than double; and as compared with an ordinary income of 770*l.* in 1862, the income last year was 1,838*l.* So that if we look at the progress of the Society as a whole, we cannot but consider that we have advanced very greatly indeed during the last twenty years. In connection with this progress I think I ought to call special attention to the steady increase of the sale of the *Journal*. You will find in the ten years 1841-50 the receipts for the sale of the *Journal* were 56*l.* per annum; in the following ten years they were 83*l.*; in the following ten, 97*l.* per annum; in the following ten years, that is 1871-80, they were 155*l.* per annum; and in the last two years the average has been 186*l.* per annum, the receipts in 1882 being absolutely the largest of any year—227*l.* I think that this large income from the sale of the *Journal* is one of the most satisfactory things we can have to notice, and I trust it will be equally noticeable in future reports. Passing from these statistics I think our first duty upon this

occasion ought to be to notice once more the heavy loss which we have sustained by death during the past year. The report mentions the name of Mr. Jevons, but since December last, as we all know, we have had to lament the death of Dr. Farr, who was more distinguished amongst us, and occupied a foremost place at our meetings. We cannot but regret these heavy losses, following as they do the death of Mr. Newmarch in the previous year. But still, the lesson which these changes ought to give us is that we should press forward in the path which these eminent men have marked out for us. We have a great deal now behind us in the history of this Society: very many excellent papers are on our records, and the names of a great many men whose reputation to a large extent has been made in connection with the Society. When we have to notice the deaths of these eminent men from time to time, we should take encouragement from the success and reputation which they have achieved, to continue in the path which has been marked out, and do all we can for the prosperity of the Society and for the cause of statistics which we are desiring to promote. Of the various points mentioned in the report, I think I ought not to pass over the fact that we have secured a new meeting place through the kindness of Mr. Mundella and the Committee of the Privy Council for Education. The place is a very convenient one for our meetings, and we find that speakers are better heard, and to some extent more interest is taken in our proceedings in consequence of having this better place of meeting. Then with reference to the future, it seems to me very important to notice the progress which has been made with the catalogue. The riches of this Society consist very largely in the library which we have come to possess. It is really a remarkably good reference library, as all those who have had occasion to consult it as I have done, know, and I do hope that with the catalogue now passing into the hands of everyone, the use of the library to the public will be very greatly increased. I trust also that some benefit may come from the committee upon the *Journal* which has been appointed. I am sorry to say, although the committee was appointed more than two months ago, it has yet been impossible to find any opportunity for our meeting, for reasons which I need not mention more specifically at the present time, as most of you will understand them; but there is still quite time for this committee to do what is necessary before the beginning of next year, when it will be possible to take some new step with reference to the *Journal*. If the sales of the *Journal* make up one of the most satisfactory features of our progress, it is surely most desirable that we should do something to put the publication of the *Journal* in even a more satisfactory condition than it is at present, and endeavour to do something more to popularise our work by means of it. It is also matter for great satisfaction I think with reference to the study of statistics, that we have been able to arrange with University College for the endowment of the Newmarch Professorship of Political Economy as illustrated by Statistics. I think by this means something has been done to popularise statistics in our educational course, and the Newmarch Committee by whom this has been effected, deserve our thanks for the work in which they have been engaged. I should also repeat

what is said in the report about our indebtedness to Mrs. Newmarch for the benefaction to the Society which she has conveyed to us. That is really a most satisfactory addition to our library, and I am sure you will all join with me in thanking Mrs. Newmarch for her kindness to us in this matter. I am sorry to have to add that nothing successful has been done in the matter of Mr. Pochin's Prize Essay, in the way of appropriating that 100*l.* which he was good enough to give to us; and perhaps it may become necessary to do what we always contemplated as being the last expedient, if we could not make any other arrangement, to advertise that this 100*l.* is open to competitors. I do not think that this is altogether so satisfactory as if we had been able to make the other arrangement which Mr. Pochin desired, but as we find that this perhaps cannot be done, we have still the course open to us of advertising that essay, and I trust the advertisements, and the essays which we may receive in consequence, will redound to the benefit of the Society. The last matter to be mentioned is the contemplated proceedings with reference to our jubilee next year. That is really a very important matter, which we ought to take up. We have now been about fifty years in existence, and have done some good work in that time, and we ought to take the opportunity of our jubilee to advertise ourselves a little, and endeavour if possible to make that the occasion of popularising our work and extending our influence. I am glad to see that so many excellent names are upon the Committee, and I trust that their efforts may be successful in making arrangements to celebrate the jubilee in a worthy manner, and especially that in some way or other they may be enabled to obtain the co-operation of delegates from foreign countries. We have not had the presence of these delegates for very many years, and I am sure we should all be the better for a little more intercourse with foreign countries, and a little more communication with those eminent men who are promoting the study of statistics abroad. I have now to conclude by moving formally the motion which I have read.

Dr. MOUAT in seconding the adoption of the report, said that in spite of the slight decrease in the elections of new members, it contained nothing to show that the Society was in any degree in a disadvantageous position. The President had rightly said one of the tests of the estimation in which the Society was held, and of the value of the work it was doing, was the increased sale of the *Journal*. A few days ago he (Dr. Mouat) received the last volume of a great work which had been for some years in the course of publication in Paris, namely, "The Universal Encyclopædia of Medical Sciences," and under the word "Statistics," he found a very exhaustive account of what statisticians had been doing in various countries; and coming to Great Britain, the writer said it was quite true that he had not many systematic or philosophical works on statistics to quote as proceeding from British writers, because the British were an eminently practical nation, who preferred recording facts to indulging in theories, but if any one doubted the thoroughly philosophical and scientific manner in which statistics were pursued in England, he had only to look to the *Statistical Journal* of that Society to show that in many of the

papers it contained it had attained the highest standard of excellence in dealing with this great question both in its scientific and its practical aspects. This was very excellent testimony to bear to the usefulness of the Society, and he hoped that the Jubilee Committee would strike out some means of bringing them more closely in contact with statisticians of other countries so, as the periodic statistical congresses no longer existed, to enable them in the future to continue the researches of the past in a broad and catholic spirit, and complete many of those investigations which had been commenced, and for the continuance of which ample additional materials had since accumulated. He had nothing more to say on the subject of the report, as the exhaustive remarks of the President had covered the whole ground. He lamented the causes which had prevented his taking a more active part in the work of the Society during the past year, and hoped that the restoration of his health would enable him to be more useful in the future.

Professor LEONE LEVI said if the Society was to ask the honour of a visit from foreign contributors, whether as official representatives or as individual members, they should be prepared to offer them a certain amount of hospitality. It was doubtless one difficulty of a voluntary society that they could not offer to pay the expenses attending visits to this country; but it would be an advantage if members of the Society would intimate their readiness to receive one or two guests on that occasion. He should be glad if they were alive to the value of this intended gathering. He hoped it would be a good one, and that the Society as such would co-operate with the Committee in order to make it successful.

Dr. GUY said that one passage in the Report recalled to his recollection what took place some years ago in that College on the assembling of the Statistical Congress. In the passage to which he alluded, it appeared to be assumed that the proceedings of our fiftieth anniversary would be in the nature of a congress, which foreigners and delegates of foreign governments would be invited to attend. He had been hoping to hear something said on the subject of house accommodation, in which their deceased colleague William Newmarch had taken so lively an interest, and he was a little doubtful whether it would be to the advantage of the Society to ask the Government to help them in any other direction than this. He did not quite like the idea of asking the Government to pay the expenses of those foreigners who might please to come over, or who might be formally delegated by their respective Governments; it reminded him too much of that bad habit into which we had fallen of paying for people that which they ought to pay for themselves. For his own part he did not care to attract to their anniversary any foreigner who was not able to pay his own expenses and had not the desire to come over at his own cost. He should be disappointed if any steps were taken which would make the Government less alive to the importance of providing them with a suitable site in a suitable locality. Their grand difficulty in housing themselves was the site; and he thought it was possible next year to come to some arrangement by which they might place

under the same roof, say, the Statistical Departments of the Government and their own Society, the Society bearing a certain proportion of the expense and perhaps some moderate sum in the shape of ground rent. He would prefer to press upon the Government the importance of that step, rather than treat next year's gathering as a congress and ask foreign Governments to send over delegates at our expense. The time could not be very distant when they would see another international congress assembled in London; but he thought their anniversary was not the proper occasion for such a gathering. He should be sorry, after so much had been done to secure permanent and fitting accommodation, to see the matter dropped; and he hoped that, if the matter were properly represented to the Government, some way would be found for giving them that which they could not obtain for themselves by purchase—a site.

The PRESIDENT said they were all very sensible of the importance of having a better place for their meetings and for their permanent residence, and if nothing had been done during the last year or two in that direction, he supposed it was the result of the complete failure of their previous efforts. He thought if no opportunity should arise at an early date, the Society would be quite prepared to prosecute the question of obtaining a better site for themselves. They hoped that the change of place of meeting, in which the Government had helped them, would be of some advantage, but whether they could go any further or not would remain for future discussion.

The resolution was then agreed to.

The PRESIDENT then moved the alteration in Rule 12, of which notice had been given. The reason of this was explained in the report. The rule when altered would stand as follows:—

“12. The Council shall, besides the Honorary Vice-Presidents and the Trustees, consist of thirty-one members, of whom one shall be the President and four be nominated Vice-Presidents. The Council shall be elected as hereafter provided. Any five of the Council shall be a quorum. From the Council shall be chosen a Treasurer, three Secretaries, and a Foreign Secretary, who may be one of the Secretaries. Six Fellows, at least, who were not of the Council of the previous year, shall be annually elected.”

Mr. BATEMAN seconded the resolution, which was agreed to.

Major P. G. Craigie and Mr. M. G. Mulhall were chosen as scrutineers of the ballot, and the Chairman, on their report, announced that the gentlemen named in the printed list submitted to the meeting had been duly elected as President, Council, and Officers for the ensuing year.

The PRESIDENT proposed a vote of thanks to the scrutineers, which was cordially agreed to.

The PRESIDENT announced that the subject for essays in competition for the Howard Medal of 1884 (with 20*l.* added), was to be “The Preservation of Health, as it is affected by Personal Habits,

such as Cleanliness, Temperance, &c." (The candidates to be referred to Howard's account of his own habits, as well as to his opinions, as set forth in the text and foot notes of his two works on "Prisons" and "Lazarettos.")

Dr. GUY proposed that the best thanks of the meeting be given to the President, the Council, and Officers for their services during the past year, and also to the Chairman for presiding on the present occasion. He was quite certain, he said, that every word of praise and appreciation which he was capable of uttering with reference to their President would be echoed by all the members of their Society. Many interesting topics had been mentioned in the report, and he, for one, could heartily agree with what had been said about the prosperity of the Society, and the appreciation in which it is held by foreigners. To this appreciation their President had doubtless contributed his full share by the papers he had laid before them, remarkable as they were not only for the facts brought under notice, but for the sound scientific spirit in which they were couched; for if there was not a statistical science in the extreme meaning of the term "science," there was certainly a considerable infusion of scientific methods into the whole field of statistics: it was becoming more and more irrigated by the streams of science. In that fruitful work England had done, and would continue to do, her part. The falling off in the numbers of the Society, alluded to in the report, might be partly attributed to this cause: that their distinguished member, Dr. Farr, during his tenure of office as president, was extremely anxious to increase the number of their members, and took steps himself personally, and caused other steps to be taken, to bring the claims of the Society under notice. Of late the attention of the officials of the Society had been forcibly directed, and their time much taken up with, the preparation of a catalogue of the library, and withdrawn from the efforts to which he had referred. But making every allowance for this and other causes which might have occasioned some slackening of progress, Dr. Guy thought the Society was in an extremely favourable position, and was likely to go on to still greater prosperity. He had much pleasure in proposing the vote of thanks.

Mr. KING FORDHAM seconded the motion. He thought the falling off in the numbers was very much more than counter-balanced by the increasing number of sales of the *Journal*.

The resolution was unanimously adopted.

The PRESIDENT, in responding, said one great pleasure in presiding over the Statistical Society arose from the confidence and support which every member gave to its Officers. He did not know of any society which had been more free from any kind of want of harmony than theirs, and he hoped this would long continue to be its characteristic. Speaking for himself, he ought to say how much he felt indebted to his colleagues for the services they had rendered. They had discharged their duties most admirably, and were especially entitled to be remembered on that occasion.

FOOD PRODUCTS *and their* INTERNATIONAL DISTRIBUTION.

By STEPHEN BOURNE, ESQ.

[Read before the Statistical Society, 19th June, 1883. The PRESIDENT in the Chair.]

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I.—*Necessity and Importance of Food.*

THE one universal want of every living creature and thing is food, wherewith to nourish its frame, repair the waste of vital power, and enable it to fulfil the great purpose of reproduction. The inanimate plant and the animate creature are alike in this respect, that though in the embryonic state formed from and nourished by the parent, no sooner does separate living existence commence, than a constant supply of food is necessary for the preservation of life, the progress of growth, and the accomplishment of nature's purpose, that life before it comes to a close should be handed on to another generation, and thus repeated until the time comes when individuals, species, and races, shall cease to exist. There is undoubted evidence that, with many variations, this must have been the law ever since life, vegetable, animal, and human, has had any being. Other things which we are in the habit of deeming necessities, such as clothing, shelter, implements, etc., may be done without, but food is absolutely indispensable to all. The plant requires no clothing but that which pertains to the embryo when first formed, or is produced from itself in the infantile stage of growth ; it has no shelter but that which it finds in the locality to which it is attached ; it needs no tools but those which are parts of itself, with which to obtain its supplies. The animal, whether terrestrial or marine, whether mammal, bird, fish, or insect, or of a form

scarcely distinguishable from that of vegetable life, is either born fully clothed, or by natural process speedily acquires all the clothing it needs; and for a home has to be content with that in which it finds itself placed, or can easily form from materials ready for use or drawn from its own internal resources. Even man may and can exist for longer and shorter periods without clothing or shelter; but without continually replenished stores of food, none can sustain, prolong, or reproduce life in itself or its offspring. Such being the undeviating law of nature, it must be of surpassing interest and importance to understand from what sources supplies are to spring, and to know what are the means and channels of its distribution to those by whom it is to be consumed.

If in the first instance we seek whence vegetable life obtains its nutriment, we have to go to the organic substances of which this world and its atmosphere are composed, to study the combined forces of light and heat, probably the yet imperfectly understood dispersion of the electric fluid, or some more subtle agency, by which changes in form and arrangement in the ground on which we tread, in the water which everywhere surrounds us, in the air we continually breathe, fit these elements for incorporation with the plant as it grows. We find this world in which we dwell, impelled by a force we know not when or how produced, subjected in turn to such alternations of temperature and moisture as disintegrate, dissolve, and recombine its particles, until they become suited for assimilation into the plant, which stretches its roots below, and its leaves above the surface, in search of those materials out of which its structure can alone be reared. Do we inquire how the life of animals is sustained? We find them primarily seeking for, and by the processes of mastication, suction, and inhalation, incorporating that which vegetation has first fitted for its purpose of food; and secondly, feeding on that which has already received animation in the lower forms as a preparation for sustaining the life of beings in a higher stage of existence. These all make use of that which is already provided for them, instinctively knowing or learning where and how to obtain possession of all which is needed to supply their wants. Passing upwards to man, we find him in the savage condition scarcely improving upon, nay in many instances, below the brute in the skill or ingenuity exercised in securing or consuming his food; but as his knowledge increases, and civilisation advances, employing the highest talent and the most unwearied industry in producing and utilising everything around him; especially so those creatures over which at his own creation he had dominion given him, for the purpose of sustaining, preserving, and multiplying the life he possesses in himself, and produces in others.

This question of food production thus involves a consideration

of everything around, above, and beneath us. In its earlier stages it is so simple as to need little or no instruction. Simple observation of the seed falling upon and sinking into the soil, or becoming covered by the *débris* of the plants around it, and watered by the droppings from the skies, would soon teach men the rudimentary mode of cultivation. But in the present advanced period of knowledge there is scarcely a science which does not, or may not, lend its aid to agricultural progress. Chemistry, teaching the constituent parts alike of the plant and the soil from which it springs, enables the cultivator to bring together those which are fitted for each other, and to vary their order so as to extract in turn from each piece of ground whatsoever of value it contains, and to return to it all that vegetable growth has abstracted from it. Physical geography shows the particular spots where the conditions are most favourable for the particular culture we wish to pursue. Meteorology does something already, and will probably do much more, in guiding the choice of times and seasons which may be the most advantageous for conducting the various necessary operations in working the soil. Mechanical art provides the implements best fitted for effecting the different processes of tilling, planting, and reaping the vegetable products. All these too render their aid towards the successful breeding, rearing; and preparing for use so much of the animal kingdom as is fitted for employment as food. And as animal life is higher than vegetable, so does it need more extended knowledge to regulate its production. Physiology, and all that is comprehended in sanitary science; architecture, the manufacture of clothing, and the means of transport, as well as methods of preservation from decay, and the best modes of cooking, are essential to the proper provision of animal, and to some extent also of vegetable food. The question then of how best to feed both man and beast is not only one of primary importance, but likewise requiring for its solution, or at least one that may be assisted by, the highest intellect and the most extended knowledge.

Nor do statistical and economic research and study fail to have their place of importance in this necessary work. The knowledge of when, where, and in what quantities the several articles which minister to our sustenance are to be found, and the understanding of how they may best be made to serve their ultimate purpose of supporting life and maintaining its vigour, are of the highest value, and worthy of the closest investigation. The increasing pressure of our population upon the means of subsistence must bring this more and more to the front, and notwithstanding all that has been spoken and written upon these subjects, there is yet room for further compilation, comparison, and utilization of all

the facts and figures which can be searched out or made known in relation to this all-important subject. It has been my wish for a long time to prepare a compendious history or statement of how the world has been, how it now is, and how it may be hereafter fed; to have ascertained and collected together the descriptions and the quantities of the different kinds of food which each country produces, and which each nation consumes. To present such knowledge in a full, clear, and yet compact form would help much to the settlement of many controversies amongst us, and to guide legislation as well as private or public efforts as regards pauperism, emigration, and fiscal regulations. The materials however are yet too scanty, and for some time to come the various branches of inquiry or action must be dealt with piecemeal, yet with the endeavour to combine the various parts so that they may each elucidate and assist all the others. Such an object as I should desire to accomplish would be too large for introducing to notice at one of the Society's meetings; our discussions are of necessity fragmentary, and it is but a small fragment that I am able to ask your consideration of on the present occasion. It is much more limited than I had hoped for; but it is the natural tendency of such fragments to gather others together. But a small stone may fit into some corner of a large building, or help to fill up a gap, and thus by bringing together dissociated portions, to consolidate the whole fabric. It is possible that the attempt to do something in this direction may stimulate younger workers in this field to search out and collect together the information which is so much needed.

At the outset a somewhat serious difficulty arises in settling what is to be embraced in the term "food." Strictly speaking, it should be confined to that which builds up the frame, and repairs the waste of the body through the performance of its daily functions. The anatomist and the physician would tell you that nothing could be properly designated as food but that which not only contains the elements which nourish the system, but presents them in such a shape that the chemistry of nature is able to transform them into flesh and blood, brain, muscle, and nerve. But so long as men have tastes to indulge, and pleasures to procure by eating and drinking, many things will pass as food which are either inert in their action or positively impede the sustenance of life. Again, "what is one man's meat is another's poison," and the widest divergence of opinions exists as to what really does or does not subserve these purposes. Once more, many vegetable substances may be so treated as to conserve or destroy their utility. Grain and sugar for instance, may be taken as means of nourishment or be converted into stimulants. Even wheat, which is deemed the staff of life, may be so dealt with, or be applied to other uses

wholly apart from its value as food. Alcohol, tobacco, and opium may possess no nutritive powers, but they become absorbed into the system, and pass out of existence for no purpose but that of ministering to bodily needs, real or fancied. The safe rule therefore seems to be to put into this class whatever we eat, drink, or inhale, and economically to put on the one side that which is thus consumed, and on the other, that which this consumption goes to produce. In the following tables therefore this rule has been adopted, although there has been as far as practicable a somewhat rough division into several classes, which will serve the purpose of such discrimination of their economic value as each reader may be disposed to assign them.

II.—*Sources of Information.*

The main sources of information have been the statistical abstracts of home, colonial and foreign agriculture and trade, but much help has been afforded by Major Craigie's recent researches, and the very valuable reports and compilations by the consuls and other agents of the American Government, placed at my disposal by the department of the Secretary of State at Washington, and the Consulate in London.

Notwithstanding the incomplete state in which many of the returns reach this country, and the utter absence of any information from many important places, the collection of the various particulars contained in the tables which follow will be found of great interest. They furnish enough facts to throw great light upon the condition in which the food supplies of many countries stand, and afford grounds for forming an estimate of some value as respects others. There is some uncertainty as to the degree of accuracy they possess; many of them are not brought up to very recent periods, they are all less full than might be desired; and like some of our own returns from different portions of the United Kingdom, the want of a uniform system of collection renders it difficult to combine them into an harmonious whole. The latest agricultural reports from Russia date as far back as 1872, and there appears to be nothing at all from the Asiatic portion of the empire. From Norway there is nothing later than 1875; Denmark, 1878; and as the population in the first two of these countries is stated to have increased some 10 per cent. in the interval, it might have been well to have made a corresponding addition to the figures given. The official abstracts contain no information from Turkey, or the provinces recently detached from that country. Otherwise Europe is pretty fully complete, and as the acreage and population of those countries from which agricultural statistics are wanting are known with more or less certainty, it may be fair to conclude that a proportionate increase upon the others

will bring the statements at least approximately up to the truth. The plan pursued has been generally to strike an average of the produce for the last three years shown in the returns, supplementing this in some cases by facts gleaned from the very interesting publications of the American Government. From Asia there is scarcely a particle of information. Even for our own empire in India there are no statements of the quantities produced, and the return which does show the extent of land under cultivation for different crops, is silent as to the most important province of Bengal. For Africa, excepting the Cape, and that is very scanty, there is nothing to be learnt; whilst for America, our own possessions in the north, with those of the United States, both of which appear to have been taken or estimated with much care, is all that is to be obtained. The Australasian figures are as full as any, and probably they are correct.

III.—*Growth of Cereals in United Kingdom and Colonies, and in Foreign Countries.*

The information contained in the following Table IA, is obtained from the Agricultural Abstracts for the United Kingdom, and that for the Colonies. In like manner IB is derived from the abstracts for foreign countries.

TABLE IA.—*Showing the Quantities of Grain, Potatoes, and other Agricultural Produce Grown Annually in the United Kingdom and Colonies.*

[In million bushels and gallons to two decimals.]

Country.	Wheat.	Barley.	Oats.	Other Grain.	Potatoes.	Other Crops.
	Bshls.	Bshls.	Bshls.	Bshls.	Bshls.	Galls.
United Kingdom	84'32	81'27	176'24	1'98	222'00	—
British India	—	—	—	—	—	—
Ceylon.....	—	—	—	—	—	—
Mauritius	—	—	—	—	—	—
New South Wales.....	3'57	0'14	0'41	4'72	2'09	—
Victoria	9'27	1'02	3'33	0'07	17'20	—
South Australia.....	10'32	0'16	0'05	—	0'81	—
Western „	0'31	0'09	0'02	—	0'03	—
Tasmania	0'93	0'15	0'76	—	1'23	—
New Zealand	8'02	1'21	8'62	0'02	4'68	—
Queensland.....	0'10	0'03	—	1'41	0'56	—
Natal	—	—	—	—	—	—
Cape of Good Hope ...	1'69	0'45	0'92	5'04	0'37	4'49 wine
Canada (Ontario, } estimated)	33'17	22'17	62'00	3'80	—	—
Newfoundland	—	—	—	—	—	—
Jamaica	—	—	—	—	—	—
Barbadoes	—	—	—	—	—	—
Trinidad	—	—	—	—	—	—
British Guiana	—	—	—	—	—	—
United Kingdom and } Colonial	151'70	106'69	252'35	17'04	248'97	—

TABLE IB. — *Showing the Quantities of Grain, Potatoes, and other Agricultural Produce Grown Annually in the undermentioned Foreign Countries.*

[In millions, bushels, cwts., and gallons, to two decimals.]

Country.	Wheat.	Barley.	Oats.	Other Grain.	Potatoes.	Other Crops.
	Bshls.	Bshls.	Bshls.	Bshls.	Bshls.	cwts.
Russia, Europe	284.91	125.63	563.29	1,077.38	345.13	
Norway	0.25	3.74	8.31	2.90	18.04	
Sweden	2.87	13.28	43.71	24.22	43.67	
Denmark	4.61	19.93	26.81	21.15	9.69	13.56 beet
German Empire	92.74	93.38	273.20	206.84	837.82	123.41 „ 0.83 tobacco Galls. 0.68 wines cwts.
Holland	5.36	4.25	11.96	15.23	36.56	7.63 beet 0.07 tobacco
Belgium	15.01	3.98	21.87	28.50	107.26	11.10 beet
France	254.09	48.97	216.23	133.68	342.94	260.40 „ 0.67 hops 0.39 oil 6.24 fruit 0.29 tobacco Galls. 0.91 wine
Italy	139.97	17.71	18.46	36.94	27.72	Bshls. 9.14 olives Galls. 605.84 wines Bshls. 11.35 fruit cwts.
Austria	37.51	43.60	88.63	100.50	222.56	75.91 sugar Galls. 56.43 wine cwts.
Hungary	71.05	37.70	44.83	118.77	70.62	26.83 sugar 1.25 tobacco Galls. 96.15 wine
Algeria	42.70	21.49	1.03	0.28	—	
United States....	428.65	40.87	386.80	1,474.18	152.07	cwts. 3.04 sugar 3.20 tobacco
Foreign	1,379.75	474.53	1,705.13	3,240.57	2,214.38	
U. Kingdom } and Colonial }	151.70	106.69	252.35	17.04	248.97	
Total	1,531.45	581.22	1,957.48	3,257.61	2,463.35	

With the exception of some few special crops, such as beetroot for sugar, tobacco, wine, &c., the particulars included in the table are confined to cereals and potatoes. It would have been possible to have stated the growth of root crops and hay for some countries, but as these are mainly used for feeding stock, they should appear

in another form, that of the living animals they sustain. Doubtless much of the grain is employed for the same purpose, and might have been excluded, had there been any means of estimating the amount so used; but, on the other hand, there must be a large amount of such roots as carrots, turnips, &c., consumed directly as human food. Roughly speaking, the one being set against the other, it may be assumed that no more is left out than is taken in; perhaps hardly sufficient to warrant the conclusion that what is given is the full representative of the supplies available for supporting the population.

IV.—*Growth of Live Stock in British Empire and Foreign Countries.*

The particulars furnished for the various descriptions of live stock are not, as with the grain, &c., those of the annual production, but a census or enumeration of the numbers alive at the period when taken; Table IIA shows those for the British Empire so far as they are obtainable, and IIB, those for as many foreign countries as the returns contain.

TABLE IIA.—*Acreage, Population, and Number of Live Stock Existing in the United Kingdom and her several Colonial Possessions.*

[In millions to two decimals.]

Country.	Acres.	Population.	Cattle.	Sheep and Lambs.	Pigs.	Goats.
United Kingdom	77·64	35·00	9·83	27·45	3·96	—
British India	578·65	202·69	—	—	—	—
Ceylon	15·81	2·76	1·03	0·06	—	—
Mauritius	0·46	0·38	0·03	0·03	0·03	—
New South Wales	198·85	0·75	2·58	33·06	0·21	—
Victoria.....	56·45	0·86	1·29	10·36	0·24	—
South Australia	578·36	0·28	0·31	6·81	0·12	—
Western „	640·00	0·03	0·06	1·27	0·02	—
Tasmania	16·78	0·12	0·13	1·85	0·05	—
New Zealand	67·42	0·49	0·62	12·99	0·20	—
Queensland	428·49	0·21	3·19	8·29	0·06	—
Natal	12·00	0·41	0·52	0·46	0·02	—
Cape of Good Hope	142·05	1·25	1·33	11·28	0·13	—
Canada	2,221·05	4·32	2·04	1·56	2·89	—
Newfoundland.....	25·73	0·18	0·01	0·03	—	—
Jamaica	2·68	0·58	0·12	0·02	0·01	—
Barbadoes.....	0·11	0·17	—	—	—	—
Trinidad	1·12	0·15	—	—	—	—
British Guiana.....	48·64	0·25	—	—	—	—
Falkland Islands.....	4·16	—	0·15	0·31	—	—
	5,116·45	250·88	—	—	—	—
Deduct, India, Canada, &c.	2,344·28	204·62	—	—	—	—
	2,772·17	46·26	23·24	115·83	7·94	—

TABLE IIB.—*Acreage, Population, and Number of Live Stock Existing in the undermentioned Foreign Countries.*

[In millions to two decimals.]

Country.	Acres.	Population.	Cattle.	Sheep and Lambs.	Pigs.	Goats.
Russian Europe	1,331·70	83·66	22·77	48·13	9·80	—
Norway	78·80	1·93	1·02	1·69	0·10	0·32
Sweden	109·39	4·57	2·23	1·46	0·42	0·10 { rein- deer 0·11
Denmark	9·44	1·97	1·35	1·72	0·50	—
Germany	133·08	45·23	15·78	25·00	7·12	2·32
Holland	8·12	4·04	1·47	0·85	0·33	0·16
Belgium	7·28	5·54	1·24	0·59	0·63	0·20
France	130·56	37·32	11·58	22·89	5·56	1·55
Italy	73·19	28·46	4·78	8·60	1·16	2·02
Austria	74·11	22·14	8·58	3·84	2·72	1·01
Hungary	79·94	15·64	4·60	9·25	4·44	0·24
United States	2,291·36	50·16	33·31	43·58	36·25	—
Foreign	4,326·97	300·66	108·71	167·60	69·03	8·03
United Kingdom and Colonial	2,772·17	46·26	23·24	115·83	7·94	—
Total	7,099·14	346·92	131·95	283·43	76·97	8·03

Of live stock it is impossible to ascertain how much is annually slaughtered, and so to gauge the meat supplies. The tables giving the latest particulars of the numbers in existence at one time are, there is reason to fear, rather less than more correct than those of the vegetable products. They are wholly wanting for poultry, fish, and dairy produce, for which indeed there is no collection of facts as to our own country, and any estimates even at home are confessedly very wide and doubtful. Both here and abroad the food provided from these sources must be a very considerable addition to the annual supplies. Major Craigie, in his recent paper read before this Society,* took considerable pains to calculate how much meat could be annually obtained from a given number of cattle, sheep, and pigs, and I am glad to see that his estimates do not falsify my own less elaborate computations for a paper read some time back before the Manchester Statistical Society.† Following his calculations, and applying the same method to the figures now before us, it may be assumed that the whole number of animals they show may yield 17,000,000 tons of flesh annually. There are many circumstances which have to be considered as rendering this estimate doubtful. Foreign animals are not generally

* *Statistical Journal*. part 1, March, 1883.

† "Trade, Population and Food," pp. 76—102.

so highly fed, or so large in bulk as our own; many of the sheep in our colonies are kept more for wool than meat, but there must be a large quantity of fish, of which we have not any pretence of an account. Yet it has been thought best to make the computation on the definite ground of the returns as they stand, in the certainty that any estimate must altogether fail of fully stating the actual supplies of animal food yearly eaten in the countries to which the returns relate. These results are not shown separately, but incorporated with those of IIIB in the first column of IIID. Both this, and that of the products of the vegetable kingdom, can only be put forth as an effort towards right statements, in the hope that they may not be altogether without value, if it be only in pointing out the deficiency of information, and stimulating efforts towards the acquisition of more.

V.—*Estimated Values of Produce.*

It will have been noticed that in the preceding tables numbers and quantities only have been collected, no attempt having been made to get at the actual values. This would be still more hopeless than weights and measures. Yet it is very desirable to have some gauge as to the relative, if not the absolute value of the produce of each respective country; and as there is a pretty definite relation between the value of an ox and a sheep, any factor which brings the disproportionate numbers and quantities belonging to each country into one representative sum will serve for comparison of one with the other. For the next set of tables, IIIA, B, C, an appraisement has been taken of each item for each country, on a uniform standard, the multipliers used being the average prices attached to each importation into the United Kingdom for the last three years, and thus a definite value is estimated for each country.

TABLE IIIA.—*Estimated Values of the several Quantities of Grain, Potatoes, &c., Annually Produced in the United Kingdom and her Colonial Possessions; Computed at the Average Rates of Imports into the United Kingdom.*

[In million £'s to two decimals.]

Country.	Wheat.	Barley.	Oats.	Other Grain.	Potatoes	Other Crops.	Total.
	£	£	£	£	£	£	£
United Kingdom	25.30	16.25	22.03	0.39	31.71	—	95.68
British India	All descriptions						450.00
Ceylon	—	—	—	—	—	—	—
Mauritius	—	—	—	—	—	—	—
New South Wales ...	1.07	0.04	0.05	0.94	0.30	—	2.40
Victoria	2.78	0.10	0.42	0.01	2.46	—	5.87
South Australia	3.10	0.03	0.01	—	0.12	—	3.26
Western „	0.09	0.02	—	—	—	—	0.11
Tasmania	0.28	0.03	0.09	—	0.17	—	0.57
New Zealand	2.41	0.24	1.08	—	0.67	—	4.40
Queensland	0.03	0.01	—	0.28	0.08	—	0.40
Natal	—	—	—	—	—	—	—
Cape of Good Hope	0.50	0.09	0.11	1.02	0.05	1.35	3.12
Canada	9.95	4.43	7.75	0.76	—	—	22.89
Newfoundland	—	—	—	—	—	—	—
Jamaica	—	—	—	—	—	—	—
Barbadoes	—	—	—	—	—	—	—
Trinidad	—	—	—	—	—	—	—
British Guiana	—	—	—	—	—	—	—
	45.51	21.34	31.54	3.40	35.56	1.35	588.70

TABLE IIIB.—*Estimated Value of the several Quantities of Grain, Potatoes, &c., Annually Produced in the undermentioned Foreign Countries.*

[In million £'s to two decimals.]

Country.	Wheat.	Barley.	Oats.	Other Grain.	Potatoes.	Other Crops.	Total.
	£	£	£	£	£	£	£
Russian Europe	85.47	25.13	70.41	215.47	49.49	—	445.97
Norway	0.08	0.75	1.04	0.58	2.58	—	5.03
Sweden	0.86	2.65	5.46	4.84	6.24	—	20.05
Denmark	1.38	3.99	3.35	4.23	1.38	1.94	16.27
Germany	27.82	18.68	34.15	41.37	119.69	20.53	262.24
Holland	1.61	0.85	1.49	3.07	5.22	—	12.24
Belgium	4.50	0.80	2.73	5.70	15.32	—	29.05
France	76.23	9.79	27.03	26.73	48.99	—	188.77
Italy	41.99	3.54	2.31	27.83	3.96	—	79.63
Austria	11.26	8.72	11.08	20.10	31.79	—	82.95
Hungary	21.32	7.54	5.60	23.75	10.09	—	68.30
Algeria	12.81	4.30	0.13	0.06	—	—	17.30
United States	128.59	8.17	48.35	294.83	21.72	—	501.66
Total Foreign	413.92	94.91	213.13	668.56	316.47	22.47	1,729.46
„ British	45.51	21.34	31.54	3.40	35.56	1.35	588.70
Total	459.43	116.25	244.67	671.96	352.03	23.82	2,318.16

TABLE IIIC.—*Estimated Value of the several Numbers of Live Stock Existing within the British Empire and in Foreign Countries, as far as can be ascertained; Computed at Average Rates of Recent Imports into the United Kingdom.*

[In millions of £'s to two decimals]

British.					Foreign.				
Country	Cattle.	Sheep, Lambs, Goats.	Pigs.	Total.	Country.	Cattle.	Sheep, Lambs, Goats.	Pigs.	Total.
	£	£	£	£		£	£	£	£
United Kingdom	127.79	60.39	13.07	201.25	Russian Europe	296.01	105.88	32.34	434.23
British India	—	—	—	—	Norway	13.26	3.71	0.33	17.30
Ceylon	13.39	0.13	—	13.52	Sweden	28.99	3.21	1.39	33.59
Mauritius	0.39	0.06	0.10	0.55	Denmark	17.55	3.78	1.65	22.98
New South Wales	33.54	72.73	0.67	106.94	Germany	205.14	55.00	23.50	283.64
Victoria	16.77	22.79	0.79	40.35	Holland	19.11	1.87	1.09	22.07
South Australia ..	4.03	14.98	0.41	19.42	Belgium	16.12	1.29	2.08	19.49
Western „	0.78	2.79	0.07	3.64	France	150.54	50.35	18.34	219.23
Tasmania	1.69	4.07	0.17	5.93	Italy	62.14	18.92	3.83	84.89
New Zealand	8.06	28.57	0.66	37.29	Austria	111.54	8.44	8.98	128.96
Queensland	41.47	18.23	0.20	59.90	Hungary	59.80	20.35	14.65	94.80
Natal	6.76	1.01	0.07	7.84	United States	433.03	95.87	119.62	648.52
Cape of Good Hope	17.29	24.81	0.43	42.53	Foreign	1,413.23	368.67	227.80	2,009.70
Canada	26.52	3.43	9.54	39.49	British	302.12	254.78	26.21	583.11
Newfoundland ..	0.13	0.07	—	0.20	Total	1,715.35	623.45	254.01	2,592.81
Jamaica	1.56	0.04	0.03	1.63					
Barbadoes	—	—	—	—					
Trinidad	—	—	—	—					
British Guiana ..	—	—	—	—					
Falkland Islands	1.95	0.68	—	2.63					
British	302.12	254.78	26.21	583.11					

These prices are certainly beyond the true value in the places of production. It requires no words to prove that a bushel of wheat or a cwt. of meat must have greatly increased in value by the cost of transport to this country, and all that can be said of the method adopted is that the pound sterling is used as an index unit, and thus becomes a not altogether untrue representative of definite quantities. If thus it appears from the table that any one country stands at twice or thrice the number of pounds that another does, it may be safely assumed that it really does grow or rear twice or thrice the quantity of vegetable or animal food, as the case may be, which belongs to the other nation. If too, as must be the case, these values are too high, it should be borne in mind that the surplus may stand somewhat in the place of the various things not tabulated, and thus the sum total for all, taken together or separately, may not be very far from a true estimate of all that is produced. To make it somewhat more full, additional columns have been introduced, reducing the several values to an average for each acre of land and each head of population. Table IIId.

TABLE III D.—*Total Estimated Annual Value of Grain, &c., and Live Stock brought together, and Divided for each Acre of Land and Head of Population in the respective Countries.*

[In £'s to two places of decimals.]

British.				Foreign.			
Country.	Total Value.	Per Acre.	Per Head.	Country.	Total Value.	Per Acre.	Per Head.
	Mln. £	£	£		Mln. £	£	£
United Kingdom	169'14	2'18	4'83	Russian Europe	608'34	0'46	7'27
British India	—	—	—	Norway	10'85	0'14	5'69
Ceylon	4'16	0'26	1'51	Sweden	31'76	0'29	6'95
Mauritius	0'26	0'57	0'68	Denmark	24'81	2'63	12'60
New South Wales	35'60	0'18	47'49	Germany	372'06	2'80	8'23
Victoria	18'89	0'33	21'96	Holland	20'11	2'47	4'97
South Australia	9'53	0'02	34'04	Belgium	37'06	5'09	6'70
Western „	1'28	0'01	42'66	France	273'62	2'09	7'33
Tasmania	2'53	0'15	21'08	Italy	110'47	1'51	3'89
New Zealand	16'34	0'24	33'35	Austria	131'38	1'77	5'93
Queensland	18'92	0'04	90'10	Hungary	110'79	1'39	7'09
Natal	2'43	0'20	5'92	Algeria	17'30	—	—
Cape of Good Hope	16'48	0'12	13'19	United States	808'95	0'35	16'12
Canada	43'65	0'08	10'10				
Newfoundland	0'06	0'01	0'33	Foreign	2,557'50	0'59	8'44
Jamaica	0'54	0'02	0'93	British	340'64	0'12	7'36
Barbadoes	—	—	—				
Trinidad	—	—	—	Total	2,898'14	0'41	8'31
British Guiana	—	—	—				
Falkland Islands	0'81	0'19	—				
	340'64	0'12	7'36				

VI.—*Values of Food Products Exported.*

Having thus seen the countries wherein supplies of food are grown, with the principal articles, quantities, and value of those from whence returns can be obtained, we pass on to that which is of more importance to England as a trading and consuming nation. It does not especially concern us to know the exact kind or quantity of food which each country produces for the use of its own inhabitants, although it is of the utmost consequence to us to know whence contributions may be drawn to our shores to meet our own necessities. Since the countries which have been enumerated are those which are the best able to part with their superfluous growth, it may be sufficient to know that whatever the number of inhabitants of other lands may be, they must be able to feed their own people, unless they are drawing their food from others. Those which are doing this, as well as those who are sending away that which they do not need or cannot afford to retain for themselves, are pretty well known through the several trade reports. As a great carrying nation our ships visit every country. They convey

from port to port by far the greater part of what is removed; and hence, for one reason, it happens that the accounts of imports and exports are far better known than those of production. These statistics too are much easier to procure than the others are, as being of actual transactions rather than estimates. There is much to be desired in the form and periods in which these are prepared, just as there is still room for improvement in those of the United Kingdom.

The following tables, like those which have gone before, are mostly taken from the official publications, the several items having been picked out from the lists of principal articles of trade, and the values being given. These are made use of rather than the quantities, since by simple addition we get the sum of the year's trade for each exporting or importing country. They are, in most cases, the average of three years' transactions, and are up to more recent dates than many of the agricultural returns. The subdivision into different classes is the same as was adopted in the paper already referred to, and is here repeated as being one that both answers the purpose desired, and renders it easy to be read in conjunction with those already in print. The first table of this series (IV_A) shows the exports of the various articles comprised within the definition of food as stated some pages back, having those from the United Kingdom at the head, followed by the several portions of the empire arranged in the order of magnitude. The column of animal food includes all meat, whether live or dead, together with such exports of provisions as, so far as can be ascertained, are of animal origin. In like manner the cereal column is made up of what is generally known by the name of corn, and whatever, such as bread or biscuit, is prepared from grain, or other farinaceous substances. Another column is devoted to sugar, spices, fruits, &c. Beverages are divided into alcoholic liquors, and the substances which we use for drinks of another kind, tea, coffee, &c. Tobacco and opium, though not articles of nutrition, are also included, having a column to themselves; and the last one is made up of a few articles which cannot properly find a place in the previous columns. The totals for each country, which, but for convenience, would have been run out at the side, will be found in a subsequent Table (VI), where they serve a specific purpose.

TABLE IV.A.—Average Value of Principal Articles of Food Products Exported from the United Kingdom and the undermentioned Colonial Possessions.

[In millions of £'s to two decimals.]

Country.	Animal.	Cereal and Farinaceous	Sugar, Fruit, &c.	Beverages.		Tobacco, Opium, &c.	Miscel- laneous.
				Alcoholic.	Other.		
United Kingdom	1'74	3'13	2'01	3'57	7'94	2'50	—
British India	—	12'92	0'84	—	4'84	13'45	—
Canada	4'07	5'42	—	—	—	—	—
Ceylon	—	—	0'08	0'01	2'96	—	—
Mauritius	—	—	3'00	0'04	—	—	—
British Guiana	—	0'04	2'02	0'26	—	—	—
Victoria	0'49	0'86	0'25	—	0'27	—	—
South Australia	—	1'80	—	—	—	—	—
Trinidad	—	—	0'84	—	0'36	—	—
Barbadoes	0'05	0'06	0'96	—	—	—	—
New South Wales	0'55	0'20	0'19	—	0'07	0'05	—
Jamaica	—	—	0'55	0'19	0'24	—	—
Newfoundland	0'97	—	—	—	—	—	—
New Zealand	0'04	0'86	—	—	—	—	—
Queensland	0'05	—	0'26	—	—	—	—
Tasmania	0'02	0'05	0'15	0'05	—	—	—
Cape of Good Hope	0'19	—	—	0'01	—	—	—
Natal	—	0'02	0'15	—	—	—	—
British and Colonial ...	8'17	25'36	11'30	4'13	16'68	16'00	—

As might be expected, the United Kingdom produces scarcely anything she can spare from the food of her own people. The whole amount exported, 20,890,000*l.*, is but small, and consists almost entirely of goods which have been brought here for a market as such, or, being of foreign origin, have gone through some manufacturing process to fit them for use. Next comes British India, which sends away some corn and rice, tea and coffee, but whose chief export is opium; altogether averaging 32,050,000*l.* Next comes Canada, with a total of 9,490,000*l.*, the largest articles of whose export is wheat and flour, to between 2 and 3 millions of money, besides other grain, with large quantities of salted meats, fish, dairy produce, and some live animals, to the extent of 4,070,000*l.* The other colonies follow in their order. The particular articles they are in the habit of selling for shipment will be best seen by consulting the table itself. The sum of all the home and colonial exports from the enumerated places is 81,640,000*l.*; but this is probably not quite all, for the returns from which these entries are extracted do not specify a number of minor articles, which may probably be to the value of 10 per cent. above those which are described, bringing up the whole to perhaps 90,000,000*l.* Of course a large portion of these exports come to the mother country, and from

her to her children. The object of this table is not to show where they go, but simply the values which each and altogether part with.

The next Table (IVB) details in like manner the trade of as many foreign countries as there is information from; the total being 304,440,000*l.*, to which is added at foot the total of the United Kingdom and her dependencies, making altogether 386,080,000*l.*, or if say 10 per cent. be added for smaller articles, over 420 millions of food products every year passing from some countries to supply the wants of others.

TABLE IVB.—*Average Value of Principal Articles of Food Products Exported from the undermentioned Foreign Countries.*

[In millions of £'s to two decimals.]

Country.	Animal.	Cereal and Farinaceous.	Sugar, Fruit, &c.	Beverages.		Tobacco, Opium, &c.	Miscel- laneous.
				Alcoholic.	Other.		
United States	28·92	53·38	0·76	0·37	—	4·69	—
Russian Empire	0·95	50·57	0·14	0·56	—	—	—
France.....	5·78	2·70	5·64	13·55	—	—	—
German Empire.....	6·51	10·68	5·57	2·44	—	—	—
Austria-Hungary	3·80	13·77	5·28	—	—	—	—
Holland	4·38	6·17	3·10	0·72	2·43	0·12	2·63
Italy	2·85	2·50	5·83	2·04	—	—	—
Spain	0·35	0·58	2·23	9·21	—	—	—
China	—	—	0·92	—	10·19	—	—
Denmark.....	3·31	4·36	—	—	0·15	—	—
Belgium	0·57	5·13	1·34	—	—	—	—
Sweden	0·86	2·17	—	—	—	—	—
Portugal	0·40	—	0·48	2·00	0·09	—	—
Egypt	—	2·10	0·83	—	—	—	—
Switzerland.....	2·05	—	—	—	—	0·44	—
Norway	1·94	0·05	—	0·04	—	—	—
Greece.....	—	—	1·73	0·05	—	0·04	—
Foreign	62·67	154·16	33·85	30·98	12·86	5·29	2·63
British and Colonial	8·17	25·36	11·30	4·13	16·68	16·00	—
Total	70·84	179·52	45·15	35·11	29·54	21·29	2·63

How large a share of the whole falls to two countries is at once seen by the figures 88,120,000*l.* (Table VI) going out from the United States, made up mainly of three classes: breadstuffs, live animals,

and meats salt and fresh, with butter, cheese and lard, and tobacco. The nation which has such enormous stores of food over and above her own necessities, and is possessed of a Government, elected by and existing for the whole of her people, has no fear of starvation, and by mere force of her supplying power cannot fail to exercise a vast influence over the welfare of the countries who consume the produce of her fields and her flocks. Russia follows next with 54,220,000*l.*, of which no less than 50,570,000*l.* she parts with in the shape of corn. Unlike the Western nation, her power to part with so much of her food is no proof of her wealth, and gives her but little influence in the world. She sends all this away, and leaves her own people worse fed, housed, and clothed, than perhaps any other nation in Europe, because she chooses to expend her means in devastating wars and extravagant splendour. Would that she could see that both the ox which treadeth out the corn and the labourer are worthy of their reward, and learn to devote her vast resources to promote the real welfare of her own subjects. France too disposes largely of her produce to the extent of 27,670,000*l.*, exactly half of which is due to her growth of wine and spirits. Some of us may think that other employment of her labour might be better for herself as well as for those to whom she sends these liquors. China would not appear in this list but for the one article of tea, for which she exchanges the opium of India to the tune of 10,190,000*l.* The table itself shows the lesser amounts which other countries part with to their neighbours.

VII.—*Values of Food Products Imported.*

Next in order are similar Tables (V*A* and V*B*), showing the value of their receipts from other countries. These, like the deliveries, are subdivided into one table for the British Empire, and another for the other countries; the one having a total of 202,960,000*l.*, the other 299,630,000*l.*, a much nearer approximation to each other than in the export accounts, arising solely from the overwhelming preponderance of the draught which this country makes upon the food products of the whole world. Of this more hereafter; but it may be noticed in passing that whereas the difference between the imports by foreign countries and British is 96,670,000*l.*, this is but little more than half the amount which England herself receives from abroad. Adding both together, we have 502,590,000*l.*, or say, with something thrown in for the unenumerated articles, about 550,000,000*l.*

TABLE VA.—Average Value of Principal Articles of Food Products Imported into the United Kingdom and the undermentioned Colonial Possessions.

[In millions of £'s to two decimals.]

Country.	Animal.	Cereal and Farinaceous.	Sugar, Fruit, &c.	Beverages.		Tobacco, Opium, &c.	Miscellaneous.
				Alcoholic.	Other.		
United Kingdom	48'47	67'51	26'99	9'60	18'50	3'59	—
British India	1'00	0'24	1'96	1'33	0'23	—	1'10
Canada	0'30	2'47	1'17	0'18	0'68	0'24	0'09
Victoria	0'86	0'41	1'04	0'67	0'68	0'18	—
New South Wales	0'01	0'55	0'68	0'77	0'50	0'11	—
Ceylon	0'15	2'00	0'12	—	—	—	—
Cape of Good Hope	0'08	0'53	0'40	0'30	0'27	0'06	—
New Zealand	0'03	—	0'55	0'42	0'24	0'09	—
Mauritius	—	0'66	—	0'07	—	—	0'10
British Guiana	0'13	0'41	—	0'05	—	0'02	0'11
South Australia	0'03	0'03	0'30	0'19	0'14	0'02	—
Queensland	0'01	0'31	0'02	0'21	0'11	0'04	—
Newfoundland	0'16	0'33	0'09	—	0'04	—	0'05
Jamaica	0'21	0'28	—	0'03	—	—	—
Barbadoes	0'16	0'25	—	—	—	0'05	—
Trinidad	0'11	0'25	—	—	—	—	—
Natal	0'02	0'13	0'02	0'08	0'05	—	—
Tasmania	—	—	0'14	0'01	0'04	0'01	—
Lagos	—	—	—	0'11	—	0'03	—
British and Colonial	51'73	76'36	33'48	14'02	21'48	4'44	1'45

TABLE VB.—Average Value of Principal Articles of Food Products Imported into the undermentioned Foreign Countries.

[In millions of £'s to two decimals.]

Country.	Animal.	Cereal and Farinaceous.	Sugar, Fruit, &c.	Beverages.		Tobacco, Opium &c.	Miscellaneous.
				Alcoholic.	Other.		
France	13'02	29'76	7'84	10'64	3'95	—	—
German Empire	6'96	24'11	0'15	2'96	7'94	2'85	—
United States	1'44	1'16	20'76	1'56	15'27	—	1'34
Hamburg	5'82	3'27	5'57	1'28	7'17	2'43	—
Holland	1'99	11'13	2'89	0'42	3'93	0'58	2'79
Belgium	4'30	14'22	—	0'86	1'79	—	—
Russian Europe	0'84	0'38	1'67	2'05	6'30	0'92	1'06
Switzerland	0'75	2'92	0'65	7'53	0'76	0'24	0'07
Austria-Hungary	1'60	5'30	—	—	2'54	2'45	—
China	—	—	—	—	—	10'65	0'25
Italy	1'58	3'47	2'31	—	1'11	0'68	0'26
Sweden	0'78	1'58	1'05	0'21	0'80	0'26	0'19
Spain	1'11	0'63	0'95	1'50	0'50	—	—
Norway	0'51	2'00	0'25	0'16	0'49	0'13	0'12
Portugal	0'62	1'36	0'44	—	—	—	—
Denmark	0'10	0'09	0'71	—	0'67	0'21	0'02
Greece	0'19	0'96	0'18	0'04	0'08	0'01	—
Egypt	0'08	0'08	—	—	—	0'08	—
Foreign	41'69	102'42	45'42	29'21	53'30	21'49	6'10
British and Colonial	51'73	76'36	33'48	11'02	21'48	4'44	1'45
Total	93'42	178'78	78'90	43'23	74'78	25'93	7'55

VIII.—*Balance of Exports and Imports.*

The next stage in the progress of our inquiry is that wherein the totals of import and export for each country are brought together, and the balance struck so as to show on which side the preponderance lies. In the next table these countries are divided into two groups, the one gathering together those wherein the exports are in excess, which will be found on the left of the page, and those wherein the imports exceed ranged on the right; those belonging to the British Empire standing first, and the foreign below. The grand total of imports is thus divided into two sums of 115,290,000*l.*—this again separated into 17,730,000*l.* for the British, and 97,560,000*l.* for the foreign—and of 387,300,000*l.*, divided into 185,230,000*l.* British, and 202,070,000*l.* foreign; the first set of figures belonging to the countries which export more food than they import; the other to those which consume more than they part with to others. Against these we have 273,670,000*l.*, separated into 56,240,000*l.* British, and 217,430,000*l.* foreign, for the exports that exceed, and 112,410,000*l.*, composed of 25,400,000*l.* British, and 87,010,000*l.* foreign, for those which are importers rather than exporters; the difference being 158,380,000*l.*, in two amounts of 38,510,000*l.* British, and 119,870,000*l.* foreign, for excesses of exports, and 159,830,000*l.* British, with 115,060,000*l.* foreign, to make up the excesses of imports. These figures will be all found in the table as the results of adding together the amounts for the several colonies and countries, and subtracting the higher from the lower in each subdivision, thus showing at a glance the condition of each country as regards trading or exchanging its food.

TABLE VI.—*Totals showing in which of the Colonial Possessions and Foreign Countries the Exports of Food exceed the Imports, and vice versa.*

[In millions of £'s to two decimals.]

Exports in Excess.				Imports in Excess.			
Country.	Value.			Country.	Value.		
	Exports.	Imports.	Difference.		Imports.	Exports.	Difference.
British India ...	32'05	5'86	26'19	United Kingdom.	174'66	20'89	153'77
Canada	9'49	5'13	4'36	Victoria	3'84	1'87	1'97
Mauritius	3'04	0'83	2'21	New South Wales	2'62	1'06	1'56
British Guiana.	2'32	0'72	1'60	Cape of Good }	1'64	0'20	1'44
South Australia	1'80	0'71	1'09	Hope			
Trinidad	1'20	0'36	0'84	New Zealand.....	1'33	0'90	0'43
Ceylon	3'05	2'27	0'78	Queensland	0'70	0'31	0'39
Barbadoes	1'07	0'46	0'61	Lagos	0'14	—	0'14
Jamaica	0'98	0'52	0'46	Natal	0'30	0'17	0'13
Newfoundland..	0'97	0'67	0'30				
Tasmania	0'27	0'20	0'07	United King- }			
				dom and Colo- }			
Colonial	56'24	17'73	38'51	nies	185'23	25'40	159'83

TABLE VI *Contd.*—Showing where Exports exceed Imports, and vice versa.

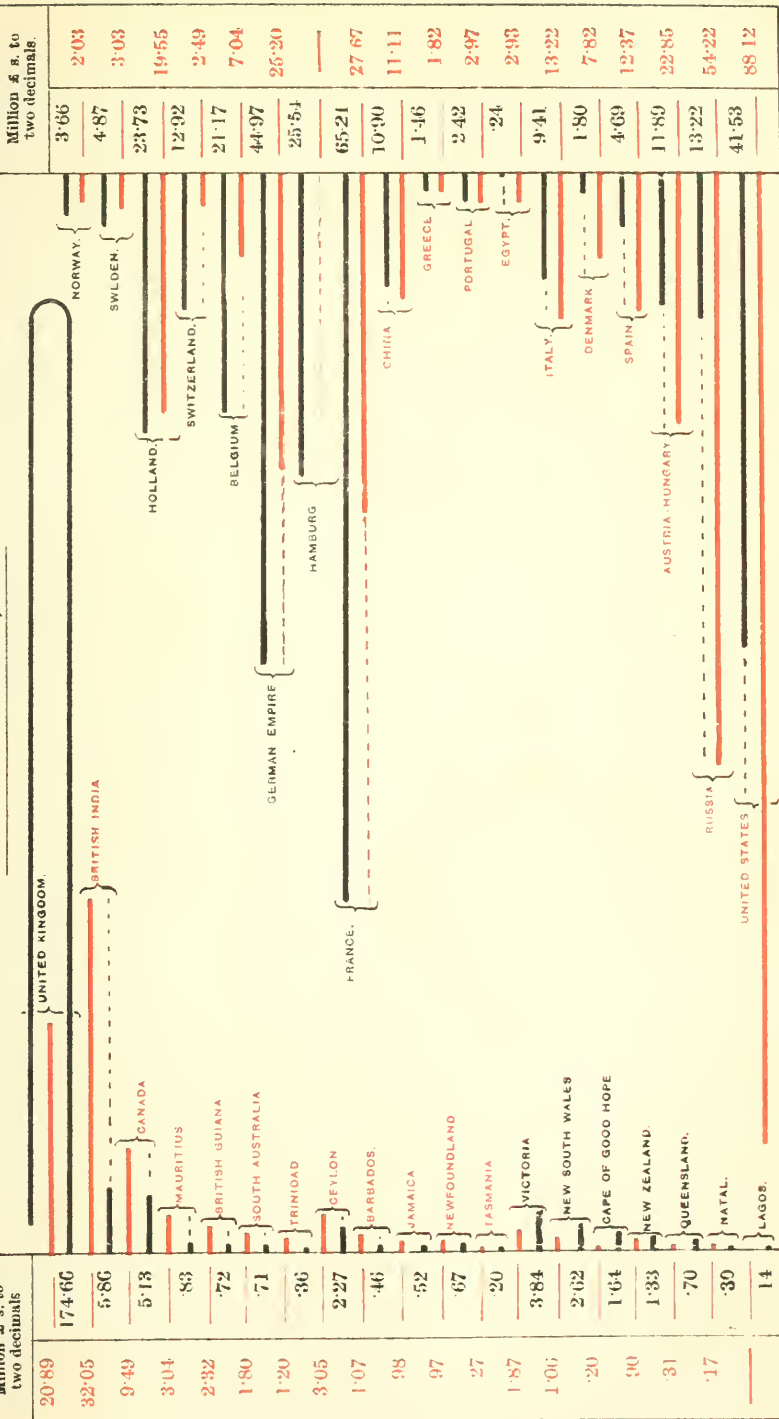
Exports in Excess.				Imports in Excess.			
Country.	Value.			Country.	Value.		
	Exports.	Imports.	Difference.		Imports.	Exports.	Difference.
United States....	88'12	41'53	46'59	France	65'21	27'67	37'54
Russia	54'22	13'22	41'00	Hamburg.....	25'54	—	25'54
Austria-Hun- } gary	22'85	11'89	10'96	German Empire..	44'97	25'20	19'77
Spain	12'37	4'69	7'68	Belgium.....	21'17	7'04	14'13
Denmark.....	7'82	1'80	6'02	Switzerland	12'92	2'49	10'43
Italy	13'22	9'41	3'81	Holland.....	23'73	19'55	4'18
Egypt	2'93	0'24	2'69	Sweden	4'87	3'03	1'84
Portugal	2'97	2'42	0'55	Norway	3'66	2'03	1'63
Greece.....	1'82	1'46	0'36				
China	11'11	10'90	0'21				
Foreign	217'43	97'56	119'87	Foreign	202'07	87'01	115'06
Total	273'67	115'29	158'38	Total	387'30	112'41	274'89

There are many points of extreme interest to be noticed in these particulars. In the first place, the United Kingdom is by far the greatest in the extent of its transactions, out of all proportion to the others in the magnitude of its imports, and still more so in the excessive difference between the food she receives and that she delivers; most of these latter being foreign goods originally imported from abroad, and of no importance in our trade but for the commissions obtained on their sale, and the employment given to our shipping both in bringing them hither, and carrying them away again. Altogether, however, these exports are very limited in amount when compared with the enormous quantities we retain for consumption. England is a great customer, and has no surplus to supply the wants of her neighbours; what these figures show of her there will be occasion to refer to again when dealing with a similar table further on, which shows in like manner to this one the transactions she carries on in goods for other purposes than food. The contrast will be a very marked one. In contra-distinction to the mother country, her eldest daughter India exports largely, but receives little, 32,050,000*l.* of the one to 5,860,000*l.* of the other. Of all the other colonial possessions there are those who together export 24,190,000*l.*, against 11,870,000*l.* of imports, and those again who receive 10,570,000*l.* for 4,510,000*l.* they give. Thus included with the United Kingdom there is a balance of 121,320,000*l.* to be provided for from the parent's resources after she has taken credit for all her children's contributions towards lessening the amount of which this large sum is the remainder. Very different is the result shown by the figures obtained by putting all the foreign countries together. The largest surplus of exports is to

FOOD PRODUCTS, INTERNATIONAL EXCHANGE.

BRITISH EMPIRE.

EXPORTS, RED. IMPORTS, BLACK.



be found in the United States, which, after setting 41,530,000*l.* against her 88,120,000*l.*, stands 46,590,000*l.* to the good. Following the western nation, comes Russia, stretching to the east, with a balance of 41,000,000*l.* in her favour, the difference between 54,220,000*l.* of exports lessened by 13,220,000*l.* of imports. Previous tables have shown that these two growers of grain thus join in providing the food which satisfies the ever increasing demands of our home population; the supplies from the west being augmented by very considerable exports of meat. On the opposite side of the page it will be seen that France is dependent for foreign supplies to the value of 65,210,000*l.*, of which more than a third is for grain, and only exports in exchange 27,670,000*l.*, of which one-half is the produce of her sales of wines and spirits, leaving, on the whole, a balance against her of 37,540,000*l.* This state of affairs with France is somewhat abnormal, owing to the devastations of the insect pest in her vineyards; for though she fairly keeps up her exports of wine and brandy, fully two-thirds of these are not her own produce, but the drainings from Spanish, Portuguese, and Italian growths. Strange to say too, notwithstanding all we hear of her beet-root sugar, her exports, which in 1881 weighed 153,000,000 kilogrammes, were more than counterbalanced by 226,000,000 which she imported—two-thirds from foreign sources, and one-third from her own colonies. Her own indigenous production in the same year, the last of which there is a published account, amounted to 377,000,000 kilogrammes, the half being subjected to duty for home consumption, the remainder giving her the means of exporting as above.

It will be seen that Hamburgh figures for 25,540,000*l.* import, without any corresponding export. This properly speaking should be credited to other countries, but whether to Germany, Holland, Belgium, or more remote places, cannot be shown; this port being one of reception of goods mostly distributed by internal means of transport. The one eastern country which appears in this account is China, whose exports of tea do not quite pay for her imports of opium. Neither of these substances are quite fairly classed as food, but, for reasons already stated, the extended definition which this term embraces renders their insertion necessary, though not altering the balance. Indeed, were the figures confined to articles of absolute value as flesh-formers, many of these balances would be greatly altered; yet for the purpose in hand, that of showing how the various nations interchange substances whose ultimate use is for internal bodily consumption, they are in their right places in these tables.

On striking a balance (Table VI) between the food-exports and imports of the enumerated foreign countries, it is important to observe that the difference is so very small, only 4,810,000*l.*, or just

4 per cent. on the side of exports, whilst for our own empire it is so large the other way, 121,320,000*l.* on the side of imports, fourfold more than the exports. It will be obvious that the same goods must appear on both sides of the account, sometimes twice over, when, as in the case of our own ports, goods are brought hither simply to pass again to some other destination, and under these circumstances it will surprise those to whom the conditions of trade are new, that the totals on each side of the account do not agree more closely. Even those who are conversant with the fact that the export values are those at the place of shipment, and the imports at the point of arrival, thus increased by the expenses and profit of removal from one country to another, will note that the difference is somewhat excessive. It is sufficiently large to suggest that the earlier remarks as to the reserve with which all these accounts must be received, were not altogether unnecessary; yet it is not so heavy as to throw great doubts upon, but rather to sustain their substantial fitness for all the inferences which have been drawn from them. As regards our own share, it must be remembered that as the chief carriers of the world, some considerable portion of this balance accrues to our advantage. Any remarks on this part of the subject had, however, better be reserved for the balances between the whole trade, instead of that portion which consists of food only. At best the distinction between what is to be classed as such can but be somewhat rough, as these figures do not profess to deal with every article of the kind, for only the principal articles are specified. It may well be that to include those of minor importance might change some of the totals, but besides this there is no security that the descriptions or classifications adopted in the one country tally with the assumptions in another. One other source of discrepancy may, indeed must exist, so long as we have not all the countries with which trade is carried on contributing their returns to the list. It is to be hoped that the agreement which does so far exist, proves that the pains bestowed in thus bringing the figures in juxtaposition have not failed to bring out facts worthy of the attention bestowed upon them. The one of paramount importance, that of the food supplied to this country, demands special consideration; but reserving this for the concluding portion of the paper, some remarks are called for upon the further Table (VII) which has been thought necessary to make the series tolerably complete, namely, that which shows the whole imports and exports that the returns contain, or, rather, those which are not food, so that by adding the two (VI and VII) for each country, we may see, so far as the records extend, what is the full traffic inwards and outwards pertaining to these countries. The amounts thus shown are not obtained by the collection together of the principal articles,

as was done with the food tables, but by deducting these latter from the total of the whole trade as stated in the accounts coming from each country. It will thus happen that any unenumerated articles of food which may have dropped out of the previous figures will be included in these, and it is probable that such as may have done so will be more amongst the imports, which, especially to this country, embrace very many minor consignments of a great variety of somewhat insignificant articles. These, it is evident, will come more frequently to the country whose capacity for reception is the greatest, and whose traffic is most widely distributed. To whatever extent this may be the case, it will go to swell the already large total of food imports.

IX.—*Exports of Goods other than Food.*

TABLE VII.—*Showing to what Extent the Exports of Goods, other than Food, Exceed the Imports in the United Kingdom, her Colonial Possessions, and Foreign Countries; and those in which Imports are in Excess.*

[In million £'s to two decimals.]

Exports in Excess.				Imports in Excess.			
Country.	Value.		Dif- ference	Country.	Value.		Dif- ference.
	Exports.	Imports.			Imports	Exports.	
	£	£	£		£	£	£
United Kingdom	256'53	215'75	40'78	British India	52'62	43'05	9'57
New South Wales	13'83	12'58	1'25	Ceylon	2'55	1'31	1'24
Victoria	13'01	11'26	1'75	Mauritius	1'54	0'45	1'09
Tasmania.....	1'19	1'16	0'03	South Australia ...	4'56	3'11	1'45
Queensland.....	2'90	2'40	0'50	New Zealand	6'00	5'15	0'85
Lagos	0'56	0'28	0'28	Natal	1'84	0'56	1'28
				Cape of Good Hope ..	6'87	4'46	2'41
				Newfoundland	0'79	0'34	0'45
				Jamaica.....	0'89	0'37	0'52
				Barbadoes.....	0'64	0'20	0'44
				Trinidad	1'92	0'65	1'27
				British Guiana.....	0'63	0'33	0'30
				Canada	13'88	8'40	5'48
British.....	288'02	243'43	44'59	British.....	94'73	68'38	26'35
German Empire.....	118'94	114'32	4'62	Russia	75'67	34'74	40'93
Egypt	10'75	6'18	4'57	Norway	4'64	3'54	1'10
United States.....	89'78	80'44	9'34	Hamburg	70'18	—	70'18
				Sweden	8'40	8'18	0'22
				Holland.....	47'28	32'73	14'55
				Belgium.....	43'32	42'43	0'89
				France	128'02	110'47	17'55
				Spain	15'73	6'73	9'00
				Portugal	5'44	1'97	3'47
				Italy	39'48	31'28	8'20
				Austria-Hungary....	47'89	45'73	2'16
				Greece	14'44	11'04	3'40
				China.....	2'18	0'63	1'55
Foreign	219'47	200'94	18'53	Foreign	502'67	329'47	173'20
Total	507'49	444'57	63'12	Total	597'40	397'85	199'55

On the figures contained in this table in conjunction with those of Table VI, it may be remarked how very large a portion of all the trade relates to the interchange of food. The two tables added together would show a total of imports 1,544,360,000*l.*, of which 502,590,000*l.*, nearly one-third, is, as we said before, for food; and an export total of 1,291,420,000*l.*, towards which food contributes 386,080,000*l.*, all the other articles which the nations of the world interchange with each other but little more than doubling that of their dealings in food. But when we look to our own country, the proportion is much greater, the food imports being 174,660,000*l.*, the total of all other articles being but 215,750,000*l.*; so that the difference between the imports and exports of food being 153,770,000*l.*, that between exports and imports of other goods is but 40,780,000*l.* Truly the necessity for obtaining supplies of food for our people dominates the whole question of the balance of trade. Not so with other countries. France, the one which next to ourselves imports the most food, with an excess of 37,540,000*l.*, increases this by 17,550,000*l.* with other articles; and Germany, importing 44,970,000*l.* of food, diminishes this by an excess in the exports of other goods. The United States, exporting 46,590,000*l.* more food than she imports, also exceeds on the same side by 9,340,000*l.* with other things. Russia almost exactly balances her account; with 41,000,000*l.* excess of food exports she takes 40,930,000*l.*, more other articles. England is thus the only country in the world which has not within herself the means of feeding all her inhabitants; for if reference be made to Table V, it will be seen that meat and bread make up together rather more than the whole balance against her which has just been pointed out.

France does at first sight seem to be treading much the same road as England, having at the same time an excess of importation of food and other articles as well; but there are several points of difference between the two countries. The most prominent of these is that she is suffering the loss of her vintage, from a cause which cannot be expected to be permanent, though she may be menaced by another, that of a growing disuse by the world of these products. Should either of these prove at all permanent, she would only have to change her cultivation, growing food instead of buying it with wine and brandy. In other respects her condition is wholly opposed to ours. With a population only exceeding that of this country by two millions out of thirty-seven, she grows 188,770,000*l.* of grain, &c., as against our 95,680,000*l.* (Table III), and possesses live stock corresponding with ours in value per head of population. The point in our favour being that we can export of everything else 256,530,000*l.*, hers are confined to 110,470,000*l.*, or less than one-half.

X.—*Conclusion.*(a.)—*The World's Production of Food.*

But it is time to draw these observations to a close by an endeavour to concentrate the points of value in the preceding tables. If India be withdrawn from Table III with regard to grain, as it was from Table II in respect of cattle, &c., for which we have no information at all, the annual production of food in the world, so far as our information extends, may be thus set forth in value, specifying the five principal countries :—

	Population.	Live Stock.	Grain.	Total.
	£	£	£	£
United States	50·16	307·29	501·66	808·95
Russian Europe	83·66	162·37	445·97	608·34
German Empire	45·23	109·82	262·24	372·06
France	37·32	84·85	188·77	273·62
United Kingdom	35·00	73·46	95·68	169·14
Other countries, British	11·26	128·43	43·02	171·50
„ Foreign	84·29	163·71	330·82	494·53
	346·92	1,029·98	1,868·16	2,898·14

If the figures given for United Kingdom be compared with those of Sir James Caird, quoted by Major Craigie in the paper before referred to, they fall considerably short of his in value; for he sets down corn, potatoes, and meat together at 190,737,000*l.*, a sum that appears to me to be somewhat excessive, for the respective quantities do not differ very widely. The sum of 169,140,000*l.* is doubtless too little, but it must be remembered that the object of the foregoing calculations is not to estimate the actual value consumed at home, but to determine if possible the relation which the quantities bear to those of other countries, and to express that relation in figures; using the pound sterling like a common denominator in collecting fractions of different value together; not to consider the varying prices of different countries, but to assume a uniform one for all. In this way the country like ours, in which high prices rule, must work out too low, whilst others are too high for actual expenditure.

Two other tests may be roughly applied. Contrasting the supplies of food of home growth with those of foreign, it has been assumed by eminent writers that the two were about equal some few years ago; the foreign should now therefore exceed; and with this agrees the sum of 174,660,000*l.* imports in Table VI, and the 169,140,000*l.* above. The exports of food from this country consist mostly of articles which are not live stock, grain, or the produce of either. Again, it is generally admitted that the consumption of

meat at home is about 100 lbs. for each head of population. In preparing the value of the amount of live stock, based on the 17,000,000 tons before stated, the quantity works out at 110 lbs. per head for all countries together, which, knowing that ours is a meat eating country, will appear somewhat disproportionate. Not so, however, when it is remembered that these estimates are formed upon the supposition of all the live stock being kept for the production of meat, whereas a large proportion of the sheep are solely used for the growth of wool, and many of the cattle as beasts of burden.

Most of the writers who dwell upon this subject, as regards our own country, make an estimate of the value of the milk, cheese, and butter, which form so considerable an addition to our home supplies of food, and set these down as together equal in value to about one-fifth of the meat and grain. How much fish may be also eaten it is still more difficult to estimate; and, great as is the uncertainty with all these articles as relates to the United Kingdom and its dependencies, it must be still greater as regards other countries.

At the risk of repetition, it must be again remarked that none of these figures must be taken as determining either the absolute value of the food by which the whole human race is sustained, for there is so large a portion of the world for which no records exist, and even those records which are available omit so many of the articles which are effectively used for supporting life. It is for comparative purposes alone that they can be safely consulted, the money value being, as nearly as may be, the representative of quantities; thus showing the relative importance of different nations as contributories to the wants of themselves and their neighbours.

It is somewhat different, however, when we deal with the transportations from one country to another. In the data here—much as there is to be desired in fulness, lateness, and complete accuracy—there is a nearer approach to certainty. The conclusions to which their study leads at least form a foundation for those which are of the greatest moment, as affecting, if not the very existence of our nation, its continued progress, excepting under very altered conditions, both agricultural and manufacturing.

(b.)—*Singular Position of this Country.*

Taking it for granted then that these figures are not far from the truth, we are again brought face to face with the isolated position in which this kingdom stands as so unable to produce its own food, and so dependent upon that of other countries; an inability and a dependence which go on increasing year to year.

But Table VI shows us also how great is our predominance as an exporting country, and hence the means by which our supplies have been obtained; for so long as the markets of the world are open to us, it matters not whether our labour is expended on that which produces or procures the food we need. Unfortunately, however, whilst ever-increasing facilities arise for purchasing, those for selling or exchanging are becoming fewer. The most ardent free trader must admit that prohibitory duties abroad are not favourable to our own progress, and that the condition of trade is not so satisfactory as to prevent uneasiness as to the results. Hence the efforts made to suggest a remedy. Three main ones are at present brought before us by those who desire to revive the prosperity of the nation, and to prevent or postpone its decline. To each of these it may not be out of place to offer a few remarks as to the bearing of the information this paper contains on the solution of the problem.

(c).—*Remedial Measures Suggested.*

In the first place it is thought that the remedy may be found in an increased growth at home, and it is sought to stimulate this by reimposing duties on imported food, thus rendering it profitable to grow more here. Can such a result be at all anticipated? Is it possible to conceive of the land in this country, not only providing for the deficiency already existing, but also for the growing necessities of increasing numbers? Even if it were possible by higher farming to increase the produce of our fields, would this be done without increasing the cost? Already grain is grown cheaper elsewhere, and can be brought here at such small increase on the original cost as to rival our own products. Is there any reasonable prospect of these things being reversed? If not, what justice or policy would there be in telling the labourer to expend his strength in the production of a bushel of corn at home, if in other ways he can produce that which obtains for him two bushels from abroad? The assertion that a duty on importation would be paid by the foreigner instead of by the home consumer is contrary to all past experience, and is utterly inconsistent with the arguments in favour of levying that duty; for if it failed to increase the price, it would also fail to stimulate increased production at home. If, on the other hand, prices rose, the cost of production of our manufactures, which are the coin wherewith we pay for food, must necessarily increase also. It is true that economy and thrift would go far to neutralise the effect of lower wages, but there can be no reason why that thrift should be practised for the benefit of but one section of the community. If we cannot grow as cheap at home as we can import from abroad, no amount of protection given

to home growers can be anything but a temporary expedient which must give way to increasing pressure. Our true policy is to employ our strength on that which will exchange for more than it can produce. The capacity for foreign production shown by the figures already given, forbids the supposition that it is wise to restrict our appropriation of these to our own use. The power which it is also shown us to possess for supplying foreign markets with goods other than food, assures us that it ought to be cultivated and extended.

In the next place it is suggested that a shifting of the burden of taxation from the shoulders of the home producer of food on to those of the community generally, would enable him to stand against foreign competition. If taxation is unequal, and there is sufficient evidence to warrant the fullest inquiry, by all means let the inequality be rectified, but the records of our export trade do not warrant the supposition that it can bear any additional weighting. If land be entitled to relief from taxation, it cannot be met by levying duties upon manufactured articles for home consumption, which must, by raising the price of all, inevitably check their sale abroad; and so diminish the power for payment in the only produce we can offer to other nations. Thus throwing out of employment, and dependent upon the rates, those who now earn their maintenance by our foreign trade.

The third remedy which presents itself is that if producers of food at home cannot supply our wants, and if consumers of other goods abroad will not take our home-made goods, we should send our surplus labour to the fields where food can be produced by ourselves. Tables IIA and IIID show the great disproportion which the acreage and production at home bear to that of other parts of the empire in even that portion of it for which we have returns. Why not then extend cultivation in our own possessions abroad, and there raise up consumers for an additional quantity of our home manufactures? Everything points to the freest exchange between the nations of the world of that which each produces, and it should be matter of intense gratitude that if the world will not yet admit us to free trade with them, we have both land and labour of our own to do without them.

DISCUSSION *on* Mr. BOURNE'S PAPER.

MAJOR CRAIGIE, in opening the discussion, wished to offer the thanks of the Society to Mr. Bourne for the valuable paper which he had placed before them. There were, however, but few points which in a paper like this could be easily discussed without preparation. No one could doubt the enormous importance of the subject, and the conclusions to be drawn from such investigations. He must own he looked with some little trepidation on the wide range now taken, and the somewhat ambitious flight into a region where the data were so incomplete and unsatisfactory. The labour of such a task as that to which Mr. Bourne had set himself was enormous. He entertained, however, some doubt that they had not got a perfectly satisfactory unit for comparing the products of different parts of the world in taking the pound sterling. The values attributed to the different countries would be to the public mind, despite Mr. Bourne's caution, not a little misleading. The value of the products was given as imported to this the richest country of the world at its ports, and this would by no means be the mean of the values throughout the world generally. Take for instance the figures in Table IIID, where Russia was credited with a production equal to four times the amount per head of the population as against the United Kingdom; such items startled one a little on reading the figures. He was not quite sure how the gap between Tables IIIC and IIID was got over, Table IIID being one of the most important summary tables in the whole paper, since in it the production of all these countries was put side by side. Here the United Kingdom was taken as producing 150·7 millions of food per annum. But in Table IIIA the annual value of the grain produce and potatoes in the United Kingdom was taken at nearly 96 millions, which would only leave something like 55 millions annually as the whole yearly value of the annual product of meat, as well as the omitted products of milk, butter, cheese, &c. How had this estimate of 55 millions been arrived at?

Mr. BOURNE said that Table IIIC was a calculation of the value of the existing stock. He had arrived at the difference between the grain and the live stock in the following table by calculating what that amount of existing stock would yield when slaughtered.

Major CRAIGIE said he questioned the total of 150 millions,* and wished to point out that deducting the annual value of the grain, 95 millions, only 55 millions was left as the annual value of the meat produced. Even admitting that dairy produce was not included in the estimate, the proportion of meat must be much too low. According to his (Major Craigie's) recent calculations, the estimated yearly home production of meat was equal to 1,240,000 tons per annum. The value of that meat, if it was taken at anything like 73*l.* or 74*l.* a ton, must be very greatly in excess of the 55 millions mentioned in Mr. Bourne's paper, and therefore he thought he must have con-

* It will be seen, on reference to the table referred to, IIID, that Mr. Bourne, in deference to Major Craigie's opinion, has taken his estimate for meat somewhat higher.—EDITOR.

siderably under estimated the value of the butcher's meat alone, without taking account of other animal products. He believed that the meat supply alone was nearer 85 millions than 55 millions. He did not propose to enter upon the very interesting calculations with reference to import and export movements which composed part of the paper, but only to insist that, as regarded relative production, there was a fallacy in taking a pound sterling as the unit of comparison. The figures would be to some extent modified if another mode of calculation was adopted. Recurring to what had been said as the aggregate value of the out-turn of the United Kingdom in the way of food, no doubt Sir James Caird's figures which had been quoted in the reference to his (Major Craigie's) paper were taken after a period of very much higher prices than at present; they must be too high for existing circumstances. In the paper he (Major Craigie) read last January, therefore, he proposed to reduce the value of the grain alone produced in this country to something like 60 millions a year, in place of 87 millions, and he gave his reasons for so doing when he read his paper. The difference between Mr. Bourne and himself was thus narrowed, but he was still unable to see how the total with regard to meat could be made up from the data now given. These points would no doubt be explained by Mr. Bourne in his reply; but if his calculations were wrong in the points he referred to, he was afraid they were also wrong in the totals for other countries. If the meat production of England was brought out at only 55 millions, then he was afraid they must be also wrong in the meat supply attributed to other countries, if the proportion annually slaughtered were assumed to be the same. In applying to foreign countries the measure applied to their English stock, estimating the amount of meat produced from a given number of animals, they were in great danger of going wrong. The proportionate number brought to the butcher annually must be totally different in many countries from what it was here, and would throw out, to some extent and in another way, the general figures with regard to animal products. At the present moment, when the question of animal imports was attracting unusual attention, it became their Society very closely to look into the question of the meat consumption of the country in any one year and the sources of their supplies, and he hoped that the paper that Mr. Bourne had so ably placed before them would be the means of stimulating discussion on that very important, but still undecided, point. He had been induced to go lately into such data as were available on this head, and the figures showed that, speaking roughly, 100 pounds of meat were consumed by each unit of the population in the course of the year. If of that 100 pounds 78 pounds, as his own investigations showed, were produced at home, and the remainder imported either alive or dead, those were figures which bore a very important relation to many of the discussions going on at the present time with reference to the importation of animals and the dissemination of disease among our home stock. His own inquiries pointed to something like a home production of meat from cattle, sheep, and pigs equal to 1,240,000 tons yearly, while we had, according to last year's returns, nearly 62,000 tons

of fresh and 170,000 tons of salt meat imported, and living animals in addition, calculated to furnish a further supply of meat equal to 106,000 tons; the total of the country's meat thus reaching 1,578,000 tons, or very nearly the 100 pounds per head to which he had referred; while, if these figures were anywhere near the truth, the relative importance of the sources whence our population were fed was shown by the home supply furnishing 78 pounds to each inhabitant, the foreign dead meat 15 pounds, and the foreign live meat 7 pounds. If they were to go more thoroughly into this question, perhaps some of the data put before them by Mr. Bourne would afford a useful starting point.

Mr. H. MONCREIFF PAUL said that thoroughly agreeing as he did with the able remarks at the commencement and the end of Mr. Bourne's paper, he was sorry to be obliged to follow very much in the wake of Major Craigie, and rather take exception to the basis upon which some of the calculations had been made. Mr. Bourne had guarded himself by saying that he could not pretend to anything like accuracy in his statistics, but this proviso, notwithstanding the tables as given, might prove very misleading. For instance, in Table IA, showing "the quantities of grain, potatoes, and other agricultural produce grown annually in the United Kingdom and Colonies," the returns for the United Kingdom were taken for the year 1882, while those for the Australasian Colonies were for 1880; and yet those two years were put together in one table as if they were returns for the same period. The same remark applied with regard to the live stock in Table IIA, that for the United Kingdom being given for the year 1882, and for the Colonies for 1880. Passing to Section 5, "Estimated Values of Produce," the index unit being taken as a pound sterling, they found in consequence on reference to Table IIIC, that while the cattle in the United Kingdom were put down at 13*l.* a head, cattle in the Australasian colonies were also put at 13*l.* a head, whereas the value of cattle in these colonies was less by 80 per cent. than in England. Taking as a further example the case of Russia, her sheep were estimated at over 2*l.* a head, or far in excess of their value in that country. Turning to the Tables IVA and VA, giving respectively the values of food products exported and imported, and taking as a type case the returns for New South Wales, it was found that the imports were 2·62 millions, and the exports 1·06 millions, showing an excess of imports according to these calculations of 1·56 millions. But if reference were made to the actual statistical returns of the colony, it would be found that for the year 1881 the imports of New South Wales were 4·87 millions, and her exports at 1·41 millions, leaving a surplus for excess of imports of 3·42 millions instead of 1·56 millions. The comparison of these tables with the actual statistics furnished by the different countries seemed therefore to point to the conclusion that they were resting upon a wrong basis, and would require modification. He believed the secret of the error lay in this, that the principle of computation dealt with in the case of imports and exports in order to reconcile values had not been applied. In order to do so they should

follow the course adopted as indicated by Mr. Bourne in the United States, of assessing imports by taking the value at the point of production, and adding thereto the cost of transit. If that same system had been adopted in the tables before them more accurate data might have been obtained. Mr. Bourne had not been able to supply statistics with regard to the wheat produced in India. That was a very important point, because India was becoming daily a more important factor in producing wheat for herself and for the rest of the world. The figures for 1881 of the produce of wheat in India showed 212 million bushels, or $26\frac{1}{2}$ million quarters, from an acreage of some 19 millions, showing a very fair yield per acre. The question of wheat production was exceedingly important, and he was glad that Mr. Bourne had given such prominence to it. France in this respect occupied an abnormal position, for whereas in the year 1882 there were obtained by Great Britain only 64 million quarters of wheat from France, in 1878 201 millions were imported thence, showing that latterly bad harvests had affected her as they had other producing countries. The question of meat importation in the shape of refrigerated animal food was one which was coming before them more prominently than ever. The problem had now been successfully solved, and the process could be extended all over the world, that is to say, that wherever there were countries which could produce animal food in excess, it might be brought by means of refrigeration to those countries which required more food, and in that way a gap might be filled up which England felt very strongly. While the trade was at present in its infancy, the day was near at hand when the annual supplies of Australasian mutton would exceed half a million of carcasses. Such imports would tend to place a wholesome check on the upward movement in values, of which there was abundant evidence in the butcher's bills so reluctantly paid by the British householder.

Mr. R. HAMILTON referring to the question of some common denominator for the various items which had to be brought together, said that though in temperate climates at all events the crops of cereals were secured year by year that was by no means the case as regards the supply of meat. Not only the *bulk* of the animals but the *time* required to bring them to maturity was a most important factor in the calculation. Scientific breeding and rearing had done very much in this respect within the last few decades. Perhaps Major Craigie could get from the Royal Agricultural Society the data from which a common unit of the food value of animals could be deduced. Even with grain in many parts of India a "wet" and a "dry" crop could be raised within the year, and this double annual supply was one reason why Oude and Bengal could support so large a population without suffering the extreme of poverty. With regard to the question of free trade, a long series of bad harvests had subjected the country to a most extreme test, but the strain had been borne with a most marvellous facility. He believed that under any circumstances short of a war of an enormous magnitude, their food supply as regards the present generation was not only secure but could be attained with great facility. The ease

with which so gigantic a difficulty had been met might well give them confidence in the ability of the country to overcome similar difficulties in the future as long as the principles of free trade were maintained.

Mr. W. J. HARRIS said he thought Mr. Paul had made a little mistake with reference to the acreage under wheat in India.

(Mr. PAUL here said the real acreage was 19 millions, and not 10 millions as he had inadvertently stated.)

Mr. HARRIS said Dr. Hunter, in his recent work called "The Indian Empire," put it at 35 millions, but he believed that was an over estimate. He (Mr. Harris) had seen it stated that 21 millions was the acreage, but he believed it was increasing every year. The exports of wheat from India had lately been larger than ever before, and it was very encouraging to know that our great dependency was able to supply so much of our food. He did not entirely agree with the last speaker on the free trade question, for he believed that the land of England was capable of producing a vast quantity more than it did at present. Lord Derby said some years ago that he was certain that its produce might be doubled, but probably that was over stating it. He (Mr. Harris) thought that if they could produce more food at home, and import less from abroad, it would be better for their manufacturing interests, because the food produced at home would be sold at home, and the money that it brought would all be spent at home. He thought therefore that we had pushed free trade too far in this country; at the same time the country was not at present prepared to put any duty on the import of food. If a suitable reduction in the burden appertaining to agriculture were made on the farming land of England, to be given in proportion to the amount of land devoted to tillage, it would be very greatly to the benefit of the country, and the produce of our present acreage would be vastly increased thereby. So far as manufactured goods were concerned, he admitted that he was a moderate protectionist, and believed that we ought to prevent the manufactures of foreign countries interfering with the labour of our own workmen to the extent they were now doing. With regard to France, he thought Mr. Bourne had not made sufficient allowance for bad crops, causing the large imports which that country had made of late years. Seven years ago France was a wheat exporting country, but for the last four or five years it had been a very large importing country. With good harvests France might again be an exporting country, and that would make a vast difference in the sum which Mr. Bourne had put down to the debit of her balance of trade in food. He agreed with what Mr. Bourne said as to a duty on the import of wheat not being of much benefit to the agriculturists in England. He believed that such a duty would in great part be paid by the foreign producer; in fact this was shown by our own history, for when the repeal of the corn laws took place, there was a great advance in the price of wheat in all exporting countries, and very little fall in this country, clearly

showing that the import had not affected the consumer to the extent generally supposed; therefore it would do the English farmer but little good to re-impose it. With regard to the last paragraph in the paper, he did not think our colonies were for the future more certain to take our goods in return than other nations, so long as they had equal tariffs against us as against others; and therefore it was a most important thing for us to try and induce them to reduce their duties in our favour by making concessions to them in return, and thus to encourage more free exchange than existed at present. The world was treating us very badly in trade matters, and we had no reason to consider the rest of the world when we were making commercial arrangements with our colonies. He did not mean to say that free exchange with all the world would not be a very excellent thing if we could really get it; but it seemed to him that we adhered to the one-sided system which we called free trade as though it were the religion of our lives, and he thought a little departure from it would in the end bring more real exchange of commodities than we ever had before.

Mr. GEORGE HURST said allusion had been made to the taxes put upon agriculture, but he should like to know what those taxes were. For his part, he generally looked upon the various taxes as being local burdens, and they were chiefly necessary for the good management of the land itself. As to the highway rates, every one who had lived in the country must know that good and perfect highways were the greatest benefit that the agriculturist could have, and where they had good highways the land had doubled in value. Poor rates were no doubt a charge upon land in the same way as the poor in towns were a charge upon the general inhabitants. If these local taxes were removed what would be the result? The tenant would not gain anything, but it would be a great benefit to the landlord. According to Mr. Ricardo's doctrine, the rent did not commence until all expenses were paid upon the land, and also the profit of the farmer; and if there was any truth in that doctrine, the removal of these local burdens would certainly bring about an increase in the rent. Emigration had been referred to. Everyone who knew much of the agricultural counties would know that a great proportion of the best labourers had emigrated, and the inferior men remained at home; therefore if they had too much emigration there would be a considerable deterioration in the next few generations. He thought it would be very important if they could give some kind of inducement for agriculturists to improve their agriculture; but this could only be done by the land proprietors themselves taking care that the tenant should not have too large a holding, but should have a holding in proportion to his capital, so that he might be enabled to improve the cultivation and to prosper himself. The great misfortune with regard to farmers throughout the country was, that they had very much more land than they had capital to work. A small farm might be too large where the means were inadequate, but no objection could be made to the large extent of the holding when the occupier had sufficient energy, judgment, and capital, to secure its proper cultivation.

MR. CORNELIUS WALFORD said that some years ago upon investigating the subject of famines, he made some attempts in the direction of estimating the food supply of the world, but found it surrounded with difficulties owing to the want of returns in any available shape. He therefore congratulated Mr. Bourne in having brought together a vast array of figures which previously were not available in any form for comparison. The broad view of the question was this, that there was a surplus of food available in certain nations, and in others there was a deficiency. The moral of the paper must therefore be that they should know which nations had a surplus, and which nations required that surplus. That being so, if they found at any time that the nations from which they drew their supply had for that particular year a failure in their crops, they would know where to look for other supplies; and shippers and others would have their attention drawn to those countries which could afford some surplus of food. Every year there was produced in the world enough food for the world, but what was wanted was facilities for transport, and a knowledge of where the surplus food was lying. In India, even in the year of famine, there had always been produced in the country food enough for the whole of the inhabitants; but in practice food supplies had been sent from other parts, because the facilities of transport as between the different localities did not exist. Happily owing to the railways he hoped the time had gone past when any great famines would be heard of there again. Every country was liable to have its food supplies destroyed, and therefore a paper which brought up the broad facts would render very good service in times to come. The economic aspect of the question was that as long as we could obtain cheap supplies of food, so long would our manufacturing industries maintain themselves against all nations.

MR. PELL, M.P., said on the whole he assented to the propositions laid down by the author. He could not, however, concur in the statement that had been made that the United Kingdom was going to double its production. No doubt those who were engaged in the production of food were doing their best, for, on the one hand, the price obtained for meat was so good that every man who had the capacity would strive to produce good cattle and sheep; and on the other hand, those who were engaged in the production of cereals were making desperate efforts to see whether or not they could grow cereals and get a fair return before they gave up that side of their production and surrendered it to other countries. He was not at all hopeless about their position, for he believed that they would still see the land best suited to the production of cereals devoted to it, and that some increased production, though not a large one, would be made. With regard to the supply of food from the United States, they must not expect too much in the way of very large continued exports of wheat, though they might look to their growing more cattle. The American found that wheat was a hazardous crop, and expensive to harvest, and that "corn" was the one to which he must turn his attention. He found that if maize was worth 15 cents a bushel in the form of grain, it was worth 25 cents a bushel when turned into pork; and

further, that while a crop of maize required to be carried to the *dépôt*, if it was turned into pork it would transport itself. Under those circumstances he was inclined to believe that the Americans would be forced into a greater production of animal food, being shrewd enough to see that that would be the better investment.

Mr. BATEMAN said France was one of the very few countries where they had had complete statistics of agriculture for the last fifty or sixty years, and they found that in the last fifty years the acreage of wheat had increased 40 per cent. and the yield 70 per cent., and yet France had become an importing country for wheat, the population not having increased. The simple reason was this, that they consumed wheat bread there very widely, instead of rye bread as formerly; and whereas sixty years ago they used some $\frac{3}{4}$ lb. of wheat per head per day, they now consumed $1\frac{1}{4}$ lb. On the other hand the wheat consumption in all the large towns except Marseilles was actually decreasing, because the people were eating meat. In Paris the consumption of bread was now rather less than 1 lb. per day per head, and of meat nearly $\frac{1}{2}$ lb. per head.

The PRESIDENT: I think at this late hour I may now proceed to ask you to give a very cordial vote of thanks to Mr. Bourne for the paper we have heard to-night. Some criticisms have been passed upon special tables which he has given us, but I think that even those who have criticised some of the figures must agree that taking it altogether, the work put before us to-night is of very substantial value. And I think with reference to that work it is interesting to point out that the criticisms which have been made only apply to a few of the tables, one or two in which Mr. Bourne attempts to make a comparison of the food production of different countries. He says, taking the value in a certain way, and putting upon the value of the agricultural production of all countries the value of the imports into the United Kingdom as those articles are imported into the United Kingdom, he obtains a basis of comparison of more or less value by which he can compare the gross agricultural production of different countries. Nobody can be better aware than Mr. Bourne that a hypothesis of this kind only carries one a certain length, and that it is liable to very great difficulties of interpretation. The criticisms which have been passed have been passed almost exclusively upon tables of this nature; but these are only a part of what Mr. Bourne has done, and I should like especially to call your attention to the latest tables in his paper, which deal entirely with data, which are very little estimated, in which he has compared different countries as regards their food imports and exports, showing how we stand in reference to this very important question. These tables will be found of the very utmost value. The one remark which I should wish to make with reference to the figures themselves, touches upon that point which Major Craigie mentioned, and I should be very much obliged to Mr. Bourne if he would tell us in what way he has dealt with the question of other agricultural productions besides meat; for if these values had been included it would tend to bring up the value of our agricultural production considerably above the figure which he has put

upon it. I think, on the whole, the estimate for comparative purposes of the United Kingdom is rather lower than perhaps it ought to be. Mr. Harris is no doubt entitled upon a question of this kind to bring up the question of free trade and protection, but I do not think any remarks which he has made to-night contribute to the enlightenment of our mind at all. The chief statement that he made is that we ought to produce much more food at home, and that it would be a better thing if we did. Upon this subject we have had the remarks of Mr. Pell, and I think he has disposed very well of the question as to whether it is within any reasonable probability that we can produce more food at home. No doubt more food could be produced if certain land which is now devoted to purposes of pleasure could be devoted to other purposes, but I should doubt very much if there is any great quantity of land that could be so utilised as to make any material difference in this question. If the production of food can be increased at home by the greater efficiency of the producers, then all that is undoubtedly a gain to this country; but if people are merely to be turned from making other things into producing food,—other things in which we have the advantage perhaps over other countries,—then it might happen that by producing more food instead of producing other things we should be losers and not gainers. Mr. Harris has not given any explanation of what he means by asserting that the increase of the production of food at home would be a good thing, and it must be quite clear it is only increased production by means of the greater efficiency of labourers, and greater efficiency in industrial and scientific appliances of every kind, that the increased production of food at home would be of any advantage to the country. Mr. Harris asserted that agriculture is pressed down by taxes, and that is a great obstacle to production. That has been to some extent dealt with by Mr. Hurst; and it surely must be as clear as any proposition can be, that the taxes to which he referred are not taxes which press upon agriculture, but taxes which press upon rent. If these taxes have any effect in diminishing agricultural produce, then it must follow that rent itself, which is much larger than the rates, is also a restraint upon agriculture, and that surely is to a large extent nonsense. No rent could be paid unless there was profit. With reference to the suggestion that there should be taxation upon the imports of manufactured articles, I think those who make remarks of that kind ought to go back fifty years and read the free trade controversy of that time. I think it would do Mr. Harris good to read the book just published containing the speeches of Mr. Villiers, in which the propositions which he has put forward were fully discussed, and at a time when we were doing all we could by taxing imports from foreign countries to promote our trade in the way Mr. Harris would like it to be promoted. The real truth is that we commenced our free trade course in 1842 and 1843, because we had found out that that mode of taxing imports from foreign countries was the worst way in which to promote our own trade. There can be no doubt, I think, that the conclusion to which the free trade party of that time came, namely, that we should take care of our imports and let the exports take care of themselves, was really the wise conclusion in this matter. I have now

o return to Mr. Bourne the most cordial vote of thanks, in which we must all agree, for the very excellent paper which he has brought before us to-night.

Mr. BOURNE, in reply, said Major Craigie had started the discussion by expressing doubts as to the unit, the pound sterling, being a satisfactory one. It was not altogether so, but it was the only one which he had time or opportunity to introduce, and whether some better one might not be devised he could not say. With regard to meat, it could only be based upon a calculation of the quantity which might be produced annually from a certain definite amount of stock. With reference to the value of the grain, &c., in Tables IIIA and IIIB, as well as live stock in Table IIIC, and also of the meat added to the grain for IIID, he took the average price of imports into England for the last three years, and he did not know that a more satisfactory unit could be chosen. With reference to the figures in the export and import tables, they were not derived from any calculation as to what might be the value of the quantities, but from the actual values recorded of the different transactions. The difficulty as to taking returns for different years in Table A was unavoidable, because the returns were wanting; but he had guarded against any error as far as possible by taking in all cases an average for three years. He believed that the system adopted in the United States with regard to value was to take the value of the goods of import at the place of shipment. In England the goods imported were valued at the point of arrival; and therefore the two figures of import and export values could not accurately be compared. As to the value of wheat in India, the 219 million bushels referred to by Mr. Pell as being raised, that was a calculation from the amount of land. He had searched the latest tables from India, and found no record at all for Bengal; and he believed that any estimate formed with regard to the amount of wheat produced in India must be simply a rough calculation from the acreage. In the case of France, as in others, he took an average of three years, and he did not know that anything better could have been done without entering into a series of minute calculations adapted to various countries, which would have been very difficult indeed to explain. He quite agreed with Mr. Harris's desire to promote free trade between the colonies; and the statistics showed that trade was increasing with the colonies in a much greater ratio than with other portions of the world. Mr. Bateman's remark was exceedingly important, but it was not one that he could deal with in the figures. The question of dairy produce was one that he could not grapple with, because there were no data on which to rest any calculation. If that difficulty was found at home, it was far greater with regard to foreign countries, and there were no data available. His endeavour had been to present something to the Society that was tangible, in the hope that it might stimulate others to go forward in the work, and in that manner step by step they would increase their knowledge, and thus advance their ability to deal with these various questions.

The THEORY and PRACTICE of STATISTICS.

(Translated and Abridged by WYNNARD HOOPER, ESQ., from DR. GEORGE MAYR'S Work, "*Die Gesetzmässigkeit im Gesellschaftsleben.*")

[This Paper has been a long time in type, but owing to the great press of original papers read at the Society's meetings, it has not been convenient till now to make room in the *Journal* for it. The thanks of the Society are due to Dr. Mayr for his kindness in consenting to the translation and abridgment.—EDITOR.]

THE peculiar phenomena which are called into existence by the life of man in a state of society, differ essentially in character from the phenomena of nature. It is hardly necessary to illustrate this by a great number of examples. The causes which have produced and maintained a particular political system, can by no means be compared with those which determine the limits of the tropical or the polar regions. The increase and decrease of crime is a phenomenon, which occurs in accordance with laws which are altogether differently constituted from those relating, for instance, to variations of heat and cold, of sunshine, and of rainfall. On these grounds nothing seems more reasonable than to consider nature and society as in opposition to one another. Nevertheless, further proof is necessary to justify so marked a separation as this. First of all, it becomes evident that it is quite erroneous to place nature and humanity in absolute opposition to one another, as is often done. Man as such is attached to nature by a thousand filaments, and is himself neither the product of art, nor of spirit, but of nature. A large part of his vital activity is entirely determined by natural laws, which fulfil themselves without reference to him, and, in most cases, without the assent of any determinate volitional influence. Just as the entrance into life of the newly-born being, exhibits itself as a purely natural process, so too at his death, man pays his tribute to nature. Even the suicide does not die once for all, through his conceiving a suicidal intention, but through a natural process which he calls into activity. Hence man is justly regarded as one of the most important objects to be investigated by natural science. In this respect he is in the same category not only with animals and plants, but with the inorganic structures. Inquiries into the anatomy and physiology of man are so far from affording a contrast to the parallel investigation of other organisms, that they can only attain to decided progress by being conjoined with them in comparative inquiry.

Nevertheless, much may be observed in human affairs, and in the ulterior arrangements which remain as lasting results of human action, which cannot be treated as purely natural processes. If we

examine more closely, we shall find that, in such cases, we have to do with peculiar forms, which owe their origin to the entry of man into a state of society. The potential development of the soul certainly lies in the purely natural product man, but the development itself is first brought about by society. In society, religious and moral feeling is awakened, in society a consciousness of right and wrong is formed. Speech itself, that conveyor of culture, is wholly and entirely a product of society. The great mass of peculiar phenomena, which owe their origin to the life of man in society, form a whole which is quite separate from the domain of natural life, and which is in a high degree worthy of separate observation and analysis.

Certainly it would argue a one-sided perception to seek for the process of association only among men. Tendencies to associated life are to be found in the whole of the rest of the world of nature. Indeed, even the minerals offer, in the special forms of many crystallising substances, the first dim gropings after associated existence. As the evolution of life goes on, association and its action meet us plainly in the vegetable world. Not as isolated individuals, but in what is really an associated state, does each single species of plant, carry on the struggle for existence. What else are forests and woods, than a special kind of society, composed of greater and smaller vegetables? Finally the associations composed of animals, are too obvious to require special mention. As is well known, a life in close communion, and carried on by a greater or smaller associated group, characterises a large number of the animal species, both of the superior and inferior kinds.

And yet, we at once perceive essential distinctions existing among them, when we compare human society with such associations as exist elsewhere in nature. Human society is capable of constant development; it has a history which is unbroken and is added to day by day. Every society existing elsewhere, in the region of purely natural life, is without a history; it takes place now as it did thousands of years ago, whether the example is that of the crystallisations arising from the evaporation of a free salt, or of the life in common of a swarm of processional caterpillars, or of a herd of buffaloes. And if anywhere among these purely physical communities of plants or animals, a trace of historical development is observable, we find that it is due to the influence of man. The mode and manner in which the plants which are useful to us, cover our fields in suitable combination, and in which the domestic animals live together, certainly shows a historical development. But this is a history which has been made, not by the plants and animals, but by men, who take both into their service.

Every phase of the history of the development of organisms,

which Darwinism brings forward as a hypothesis, remains, in any case, quite unsuited for comparison with the constantly and uniformly progressive and never-resting history of the human race. In comparison with this, even if the existence of these phases of development is destined to be raised from a more or less vague probability to the rank of scientific certainty, they are nothing else than physical processes, similar to those changes which have been taking place in the star-systems during thousands of years.

The result then, so far, is that we once more find in human society an independent region of peculiar circumstances and phenomena. But this ought not to hinder us from adding the admission, that, without doubt, countless relations exist between nature and society.

Human society is influenced in a high degree by nature. The latitude in which a man lives, and the blood which flows in his veins, determine the essential character of his qualities, in so far as he is considered, not as an individual, but as a part of society. And *vice versâ*, human society exerts its transforming influence on nature. Nothing lies more obviously plain to unbiassed observation than this. Let anyone merely compare in thought the present appearance of the portion of the earth which is now covered by the city of London, with the wild aspect of the same tract of country, previous to its occupation by a community of men. It suffices too, to contrast a well-cultivated district in Germany or France, with an ancient American forest, to gain an overwhelming impression of the alteration of the earth's surface produced by human society. He who looks down from the charming heights which rise gently above the Etschthal near Roveredo, upon the luxuriant valley, with its manifold cultivation, its dozens of villages, and hundreds of country houses, and then perhaps calls to mind the forest wastes which exist in the interior of Russia, will comprehend what a deep impression human society may make on nature.

This very action and reaction, occurring between nature and human society, is fitted to arouse an interest in the great region of inquiry which the latter offers to us. If the saying, that "what-ever exists is worth becoming known," holds good of any matter at all, it is true of social life. We proceed to inquire next, what modes of investigating human society are open to us.

If we make a survey of the studies which make up the totality of human knowledge, we shall find that the social man and his operations have been since ancient times, and in the most various ways, the object of eager investigation to the learned. We may almost say that the peculiar actions and qualities of the social man have occupied the thinkers of the different nations much earlier, and to a much greater extent, than the facts and phenomena of the pure natural sciences. The spirit of man seems formerly to have

cared far more to be busied with itself than with the objects of external nature.

First of all, we have philosophy. She desires to grasp and analyse the spirit of man in the abstract. But in this she deludes herself. That which she seeks she cannot find, for this spirit in the abstract does not exist. Spiritual life is developed first in society. Whoever approaches this matter in any mode whatever, whether it be by the more insecure method of deduction, or by the more laborious but less uncertain method of induction, never studies the abstract man, who does not exist at all, but merely man in a state of society.

Certain studies which assist inquiry into society, and which scientifically analyse certain isolated results of social life, are even more suitable for recognition than philosophy. What else can be claimed by the true science of theology, which raises itself above the mere collecting and handling of the dogmas of a single sect, than a set of investigations regarding the peculiar intuitions which have been produced, with their diversities as regards time and place, by the homogeneity of feeling in religious matters, which has grown up in society? In human life there is a strong tendency to mysticism, which seems only to meet with permanent and complete satisfaction by means of union to form religious associations. These, like the mass of religious conceptions on which they rest, are an unequivocal image of human society. Whoever busies himself with them, subjects to analysis an important, and for human civilisation, a highly characteristic form of the phenomena of social life.

If in human society at large, men have been principally led towards separate religious sects by internal psychical tendencies, it was chiefly the external needs of a peaceful and secure life, especially the need of security for person and property, which led to the growth of the idea of justice and the rise of political communities. Justice and law are conceptions which are quite strange to the isolated man above alluded to. As soon as an association of men comes into existence, the sphere of the power of the individual must be contracted. And therein we have the commencement of the development of the idea of right. It was not by a direct leap that mankind passed from this idea to our modern law-books, with their numberless paragraphs, but by a gradually ascending series of steps, consisting of the stages of development of this phenomenon of social life. The science of law, then, joins in working at the general problem of the investigation of social life. In so far as it inspires legislation, it may, in addition, gain an immediate practical influence on the regulation of this social life.

The productive activity of man, no less than life on a basis of law, seems to be peculiarly a product of society. Only a few have

realised how much they rely on the widely-extended co-operation of society in the ordinary provision for the daily needs of life. In a highly-developed state of civilisation, for instance, among the population of a capital, it is an unimportant exception for one man out of the hundreds of thousands who labour and produce daily, to apply any at all considerable part of what he produces to the satisfaction of his own wants. He gives almost all he produces to the community, and takes almost all he requires from it in other goods. And the whole of this thousandfold exchange, of which money and credit are the powerful promoters, goes on, as a rule, smoothly and noiselessly, and not in consequence of legal ordinances, nor in consequence of sentimental love of one's neighbour, but entirely through the force of well-calculated egoism. Human society attains its highest triumph in the economic arrangements of life; here it shows itself in the plainest way as possessing a capacity for production, contrasted with which isolated human existence seems like mere impotence. Without the co-operation of society the very strongest man—the man who is most richly endowed with external aids to existence and action—is powerless. In the social state, the poorest man may have at his disposal, by the most insignificant expenditure, numberless men and natural forces. Does the dweller in Königsberg, who has sent a letter to Ala for a groschen, consider what a huge expenditure of capital and labour, ranging from the service of the postmen to that of the engineers who superintended the construction of the Brenner line, was necessary, in order to fulfil his desire so cheaply? And could we mention any greater example of what society performs for the economic interests of man, than the postal arrangements for the whole world? Economic science, then, devotes its whole force to the scientific investigation of a particular branch of social activity.

Great as is the magnitude of our formal judicial system, and marvellously as the free development of egoism acts in our economic system, yet even these are not sufficient to satisfy the wants of human society. Society demands that the State, and the communities which co-exist with it, for instance, the communes, should specially undertake the charge of the interests of society, and interfere here and there, partly to remove obstacles, partly to promote these interests directly. Politics is the name given to the contents of this complete sphere of activity, which superintends private affairs and the judicial system. Politics, too, has grown up from out of the interests of social life, and a scientific investigation devoted to it is doubtless an inquiry into a class of social phenomena.

The science of history should also be remembered. It evidently busies itself with the study of human society considered in regard to its development in time, and its grouping into States and peoples.

Hence it has, pre-eminently, to deal with the most pregnant phenomena of political and national life. History cannot claim as its exclusive field of observation any particular sharply-defined set of facts, such as those considered by the science of law or of economy. It seizes, now on this, now on that, phenomenon, it attends now to the religious or the legal, now to the economic or the political division, according as one or the other is characteristic of a people or a period. It has been said (by Rümelin), and not untruly, that history, if it desire to give the characteristics of complete periods, States, and peoples, must, with more or less tact and accuracy, treat particular persons and facts as typical, although there is a contradiction in treating what is merely prominent as typical.

The work of all the branches of study which have been mentioned above, is evidently to elucidate and explain single classes of the phenomena of social life; but they are not concerned with the scientific analysis of human society itself, or with the explanation of the subjection to settled order and law, which to a large extent underlies it. That society is an object of scientific cognition has only been discovered in modern times. It is only possible, indeed, by means of a system of exact observation of aggregates of the facts of social life. The value of exact observation has only become generally known concurrently with the modern development of the physical sciences. Only an age which was ripe for exact physical investigation could witness the establishment of exact social investigation on the basis of a system of observation of aggregates in number and proportion. It is easy to understand that the systematic observation of aggregates of phenomena has a far higher value in the attempt to attain to a knowledge of the social life than in the physical sciences, and even that it should become of an exclusive importance in the former. Society is itself nothing but an aggregate phenomenon, whose laws, for that very reason, can only be discovered by means of the observation of aggregates. While the most important qualities discovered by the physical sciences can be predicated of the unit with the utmost confidence, the individual man, although he is a portion of society, is in no respect a correct representation of the typical social man. The latter can only be obtained by the aggregate-observation of thousands and millions, and cannot be discovered in the person of any actually existing individual. That which really is a part of the social man, will likewise take its place in the acts of the social man, and with those permanent results of these acts, which are also accessible by observation.

This system, namely, quantitative aggregate-observation, forms the essence, and the problem, of the modern branch of knowledge which we call statistics. Hence statistics appear as the scientific

means for the investigation of the peculiar nature of human society, which must be grasped numerically, and in the aggregate; and also for the establishing of the rule of law in social life.

In this work it will be shown how far statistics have already solved this problem, and what is to be expected from their further development. But first it is incumbent on us to make ourselves familiar with the aggregates which have helped us to conquer this new region of knowledge, and of which a still more extended use will be possible in future. This introduction, explaining the peculiar character of statistical inquiry, seems to me to be no mere by-work, but one of the most essential objects of the present work. It is evidently of far less importance, that the statistical materials, which exist among the various aspects society presents, should be placed before the reader in their full details, than that his interest should be aroused in statistical inquiry as such. But this object requires first an examination of the essence and method of statistics.

I.—*Statistics as the Means of Acquiring a Knowledge of the Laws which Regulate Social Life. Its Nature, Problem, Method, and Mode of Exposition.*

Few sciences have been defined in so many and so various ways as statistics, although it is one of the more modern subjects of study. It would be inconsistent with the object of this work, were I to offer the reader an enumeration and criticism of the dozens of proposed definitions. Only a few general remarks, therefore, can be devoted to the special fact of the excessive number of definitions of statistics.

This phenomenon will be understood, when we remember that various kinds of statistical inquiry had existed long before the expression "statistics" was invented. Professor Achenwall of Göttingen, the first writer to employ this word, about the middle of the last century, named his collection of so-called noteworthy political matters, *statistics*. As a matter of fact, the exact observation of aggregates, had only a very modest part assigned to it in the material of Achenwall's Statistics. This latter consisted chiefly of a collection of notices regarding the condition of States and peoples, pretty much resembling those we find in a school geography, or under the heads of the names of the principal countries in a conversation book. On the other hand, long before Achenwall, there had been, particularly in England, many exact observations of the circumstances of populations, in regard especially to mortality, partly carried out through pure scientific interest, partly for practical purposes connected with insurance. The first scientifically valuable treatise on these observations of the state of population which appeared in Germany, was the classical work of Süssmilch, the first edition of which was printed in 1741. It bore the charac-

teristic title "The Divine Order in the Changes occurring in the " Human Race, proved by means of the Births, Deaths, and Propagation of Mankind." These inquiries, which were not designated in the last century as statistical, but were usually considered as belonging to political arithmetic, are far more allied to modern statistics than were the original works of Achenwall. The Science of Statistics then, as a scientific conception, has experienced some changes during its history, by which fact the great number of its definitions is to a large extent explained.

In addition to this, there is further the fact, that, even at the present day, people use the word statistics sometimes in a wide, sometimes in a narrow sense. The first is the case when we speak generally of the Statistical Method of scientific inquiry; the latter, when the subject of discussion is the more contracted field of the independent Science of Statistics. The "statistical method" is not confined to the treatment of society; it holds a place in the observation and scientific use of purely physical facts. We may indeed include under the head of statistics in the wider sense, *i.e.*, under the head of statistical method, all determination and grouping of facts which rest on the quantitative observation of aggregates. The well-arranged returns as to temperature, rainfall, direction of wind, quantity of ozone in the air, which we obtain from meteorological stations, and which, for their sufficient exposition, require numbers and ratios, are obtained by the statistical method, in the very same sense as are the constant returns of births, marriages, and deaths, of the prices of commodities, and of the crimes committed and punished.

It does not at all contribute to the clearness of our insight into the nature of statistics, that statistics, and the statistical method should be spoken of in so vague a way. Hence it has with reason been proposed to speak in such cases as the above, not of the statistical but of the numerical method. But it will be hard to resist the prevailing usage with success, and therefore, for a long time, we shall probably hear the phrase "statistical method" employed in a general sense, and by no means confined to the independent realm of statistics.

The observation of purely physical facts, which have no connection with the social life of men, is excluded from the field of the independent science of statistics. While the statistical, or numerical, method holds sway, wherever there occurs a quantitative determination and co-ordination of facts, based on observation of aggregates, the field of the science of statistics is restricted to the quantitative investigation of the social life of man, which is only attainable by means of the observation of aggregates. Accordingly, I may define the statistical science as the systematic statement and

explanation of actual events, and of the laws of man's social life that may be deduced from these, on the basis of the Quantitative Observation of Aggregates.

At first sight it may surprise us that the quantitative observation of social aggregates should constitute an independent department of knowledge, while the same claim is not recognised in the case of the observation of purely physical aggregates. Why, it may be asked, should we in one group of aggregate-observations speak of an independent science, in another merely of a method?

One fact, which serves to answer this question, has been already slightly touched on in the introduction. But the question itself, which concerns the very right of the statistical science to exist, is important enough to deserve that in this place a complete reply should be made to it.

In the department of the physical phenomena which exist apart from social life, the scientific collection and co-ordination of facts, and their employment in quantitative aggregate-observation, and therefore the result of the application of the numerical method, belong not to a new independent science, but to the already constituted physical sciences. These certainly combine, in many cases, quantitative aggregate-observation with qualitative and quantitative unit-observations of the objects which lie within the province of their inquiry. But the definite fact remains, that the physical sciences strive to solve the majority of their problems by the latter methods of inquiry, which are entirely opposed to the statistical method, and that they employ quantitative aggregate-observation not as their exclusive method, not even as their primary method, but only as an auxiliary instrument of inquiry. The marvellous advantages of experiment for the establishment and extension of a scientific knowledge of physics, consist peculiarly in the contriving of particular unit-observations, which observations are at our option, are caused by us, and are accompanied by all the guarantees of exact investigation. It is quite otherwise with the observation of social facts. Here the laws of society cannot be discovered through qualitative and quantitative unit-observation, but only through quantitative aggregate-observation. Society is not a single individual, accessible as such to unit-observation, but a whole, composed of individuals. He who would gain a scientific knowledge of this whole must seek to extend his observations to all, or at least to as many as possible, aggregates of individuals, to their actions, and also to the effects of these actions.

The ideally best method of inquiry would therefore be the totality-observation of every single individual fact. Human imperfection, however, does not admit of our defining the totality-observation of all mankind as the true principle of statistics.

What is necessary rather than this, is to give up collective observation, and rest content with aggregate-observation. Not even the simplest social facts can be determined for all the human race, either now or for hundreds of years past. Nevertheless so much of the ideal principle of statistics remains, that, *cæteris paribus*, aggregate-observations give us better statistics the more they approach to totality-observation.

The sum of those social facts which can only be determined in their importance for society through quantitative aggregate-observation, forms the subject-matter of the special science which we call statistics. The difference between the peculiar methods of observation of this statistical science and the physical sciences is so important, that we are justified in making them plainer by the following remarks.

In order to determine the essential physical peculiarities of any species of plant, for instance, the *Anemone nemorosa*, it suffices to observe single perfect specimens of this species in the various stages of its development. The observations will in this case be partly qualitative, by ascertaining and noting down its peculiarities; partly also, quantitative in number and proportion; for instance, by the determination of its stamens, of its chemical constitution, in percentages of the separate elements: but they will always be unit, or individual, observations. It is still an observation of this class, even when more examples of the anemone in question, instead of one, are examined, with the view of checking and guaranteeing the observation. We could only speak of an approximate aggregate-observation if we desired to ascertain the geographical diffusion of the *Anemone nemorosa*, that is, to ascertain a circumstance of its social existence. Such an inquiry, however, in spite of its interest, is only of secondary importance. At all events, no one would assert, that the *Anemone nemorosa* could not be exhaustively treated by physical science, without a knowledge of its geographical relation.

Man also is treated, by anatomists and physiologists, on the basis of unit-observation, as an object of physical inquiry. No anatomist would require to dissect all; or even millions of men, in order to judge of the nature of the human skeleton, or of the muscular or nervous system, and in this way obtain scientific results.

If, however, man is to be scientifically investigated as a unit of society, the aggregate-observation of statistics is required. In order to obtain information regarding the mean duration of life, the inclination for marriage, or the tendency to theft, existing within a given social group, it is not enough to observe one individual until his death, but *all* individuals that exist in this social group, must be subjected to continuous aggregate-observation by means of statistics. If we were to actually observe *one* individual with regard

to these social phenomena, we should soon discover to how small an extent he supplies the type of these phenomena. The individual would certainly die, but, in all probability, at almost any age except the mean age; very likely he would not marry at all; and, let us hope, he would not steal at all, either.

When the operation is concerned with the laws of social life, quantitative aggregate-observation is not a secondary, or to some extent, supplementary method, but the only possible mode of investigation. This is the deeper reason why the quantitative aggregate-observation of social facts offers to us, in the science of statistics, an independent, well defined, and rich department of knowledge.

In the above definition of statistics, there was no mention of the *State*. This may perhaps surprise many readers; for the illustrious originator of the modern scientific tendency of statistics, the Belgian Quetelet himself, who, more than any of his predecessors, desired to conceive of statistics as the exact social science, marked out its problem, as "The representation of a State at a given point of time." In this is perceptible, on the one hand, Achenwall's obsolete conception of statistics as a collection of remarkable facts concerning a State, and on the other hand, an inadequate comprehension of the whole extent of the domain of the social sciences, of which the political sciences form only a part. A clear insight had not yet been attained into the nature of society and its various phenomena, and statistics were consequently looked upon as an auxiliary instrument of that very important, but by no means exclusively important, kind of phenomenon, the State.

In view of the present position of the science, the limitation of the subject-matter of statistics to the description of the political circumstances of a country, must be considered as an obsolete and untenable point of view. Nevertheless, it must be admitted that *the relations between statistics and States are many and intimate.*

Such relations arise principally because the State itself is, as has been already remarked, a phenomenon, and, indeed, the most important and most obviously perceptible phenomenon, of social life. All "political" facts, which are suited for quantitative aggregate-observation, form on that ground objects for statistical inquiry. In this case the problem of statistics seems not merely externally but essentially marked off in accordance with the special departments of the State. Such is the case when the subjects for examination are statistics of the finances, or of the elections of representatives of the people in a particular country.

In addition, it is to be observed that some facts which in themselves, and as social facts, have a purely human character, first become capable of being observed, and accessible to the comprehen-

sion of statistics, through the peculiar interest which the State takes in them, and the concrete character which it impresses on them as political facts. Statistics of immorality can never exist as such. Even the greatest enthusiasts for statistics would give up all hope of collecting materials for such statistics by interrogating their average man as to his course of life, and especially on his evil deeds. On the other hand, statistics of criminality do exist. That isolated fact which, as mere immorality, would have escaped statistics, can be grasped as soon as it appears with the concrete impress of an infraction of the State's laws, and thus becomes known. Here, then, it is the branding of a determinate human act by the State, which renders possible its entrance into the field of observation of statistics. Further, in the case of well-established violations of the law, the State renders to statistics a priceless service, by its careful search for the perpetrator, and its ample qualification of the deed in the verdict. The same is true of the law-giver, who, in the penal code, carries out a classification of crime which is highly important for the statistics of morality. In all such cases where the concrete character given to the facts by the State is of peculiar importance for their inclusion in statistics, the scientific operation in which this material is employed will usually take into account the boundaries of the State. This will be particularly the case if, as in the matter of crime, the character thus made clear varies more or less in each separate district of the State.

One important common relation between statistics and the State consists in this—that the most notable and the most comprehensive aggregate-observations of statistics would usually be quite impossible to perform, even in cases where political facts are not primarily in question, without the assistance of the authority of the State, and the thousandfold ramifications of its administrative organs. How could a census, in taking which the collectors should perform their work in every district of the country in one day, be effected without the State taking a direct share in its management? Who could rely on constant and regularly compiled reports of births and deaths, if the State did not take over the collection of these data from the registrars of the civil State, or the parish registrars? This necessity for obtaining the fullest assistance of the State in making arrangements for the most important collections of statistics, has led to the rise of official statistics, the organisation of which will be specially treated of further on. In these cases, of course, it is only the collection and grouping of the facts by the servants of the State that is official in relation to the statistics, and not the further scientific work which must be done in order to make use of the official numerical materials. In relation to the scientific work which depends on the official numerical materials, nothing is more natural than that, while making use of

the material collected on the same plan in all parts of the dominions of the State, the process should as a rule be limited by reference to the districts of the State. From the scientific point of view, however, there is nothing to debar statistical inquiry from overstepping the frontiers of the State. Indeed it is desirable that this should be done to some extent in regard to all social facts which possess a purely human character (as, for example, deaths and births), and which we meet with in a state of classification according to political boundaries, merely in consequence of the inability of the servants of the State in those early times to collect facts outside those boundaries. Evidently, in such cases, it might be much better to found a comparative inquiry on geographical than on political differences. Assuredly it is better to investigate separately the mortality of the Alpine region, the Suabian-Bavarian table-land, the Böhmerwald, the chain of the Jura, the plateau district, the Rhenish flat country, and so on, than merely to determine the general mortality of Bavaria, of Würtemberg, of Baden, and of Hesse.

The so-called geographical method of statistics renders it possible to combine a regard for that which the political method of collecting the materials requires, with the satisfaction of the demand that the most important statistical inquiries shall be freed from the trammels imposed on them by political boundaries. It is therefore necessary to supply a more detailed explanation of this method.

A great deal of the scientific worth which modern statistics can claim for themselves, they owe to the reforming influence which the investigation of the "laws of large numbers" has had on the older incoherent and scientifically defective collections of notes, to which the name of statistics was given. It has been discovered, that definite conformity to rule and law cannot be traced by means of isolated observations of actual facts, while by means of statistical aggregate-observation of these facts, these conformities become perfectly evident. Süssmilch worked on this plan in Germany, more than a hundred years ago, and later during the present century, it has produced splendid results, in the hands of the Belgian Quetelet. Statistical science thus directed, strives in all cases to obtain averages from the largest possible number of observations, and finally to arrive by calculation at the average man. The actually observed differences of phenomena, in relation to time and place, are treated as more or less extensive variations from a Type, which is represented by the grand average thus obtained, and to which they are subordinate in importance. This conception of statistics would find its highest aim attained, could it, year by year, treat unhindered the whole earth as a field of observation, and make in it

a uniform set of investigations, and from millions of facts obtain the grand average of the world.

It is impossible to mistake the strong influence which this conception has had on modern statistics. Nevertheless, there prevails a feeling, that the whole of the results which may be expected from statistics, cannot be attained merely by means of the "average man," and especially not by grand averages alone.

Certainly the grand average, in which differences of time and place are reduced to zero, possesses its peculiar worth. It is the shortest and most general expression of the compensations which act, through the juxtaposition of millions of observations of facts, on the differences of time and place, to produce one single unit of investigation. Such an abstraction as this is easy to handle; it supplies a first general view of the probable state of things. Much which, in the multiplicity of phenomena, influences and distorts their broad outlines, vanishes before this, so to speak, telescopic inspection.

This grand statistical average, which ignores time and place, is authorised, and its nature made evident, at the commencement of modern scientific statistics. Simultaneously with these authorised inquiries into grand averages, there arises a further, not less important and sometimes much more comprehensive process, namely, the scientifically exact conception of the differences in the phenomena of the social state, in relation to place and time. This problem essentially varies in character, according as the differences are those of time or of place. It is simpler in the case of differences of time, more complex in that of differences of place.

The further examination of the question how best to employ scientifically differences of statistical results in regard to place, leads to the "geographical method" of statistics.

The divisions of time into which statistical observations are analysed are partly supplied by nature itself—such are the year and the day; partly by widely recognised customs—such are the week and the hour. Hence the complete similarity of its divisions of time, from the earliest ages, is, with a few exceptions, secured to comparative statistics. This gives differences of time a high importance, and a special scientific value in statistical observations.

Opposed to these are the divisions in space which usually form the basis of comparative statistical inquiries, and which are entirely dissimilar and arbitrary.

Comparative statistics usually effect their calculations by means of average results for whole countries, or, at the best, for large constituent parts of these which have been fixed on by administrative arrangement. Clearly this mode of comparison does not correspond to the more profound requirements of science, because the various

countries and provinces are of very different sizes, and because, in average results for whole countries and provinces, the very heterogeneous circumstances of the smaller tracts of country become obliterated, thus producing a collective expression which is only accurate in appearance. Even in this case the grand average has only the value of a first general approximation, which must be followed by the more accurate conception which includes the differences in place. The grand average for whole countries and provinces does not satisfy this need for an exact comprehension of the differences in place of the circumstances and phenomena observed by statistics. And here the geographical method is of use, which method explains the effect of the peculiar geographical formation of the natural districts, in regard to the statistical circumstances in question.

For this purpose it is necessary that the statistical processes of Observation and Treatment of the material should be confined to small sections of country, the lower limit of whose size is only defined by the necessity of procuring a number of observations sufficiently great to produce an average result. We thus obtain the statistical results for these small sections, and, by juxtaposition of equal or similar results, we get the natural districts corresponding to the concrete facts. The groups are in this manner discovered, and have an altogether different geographical appearance, and a totally different system of boundaries from the States or provinces.

Every branch of statistics which rests on the observation of facts differing as to place, has its special geography, of which averages obtained from whole countries and provinces can only present a caricature. The boundaries of the natural groups supplied by a social phenomenon, and those of the chief political divisions of a country, intersect each other at so many points, that if our consideration is confined to the latter, all profound scrutiny of such phenomena comes to nothing.

The geographical method of statistics shows itself peculiarly effective, if it is applied for the purpose of comparison, in such a way, that the natural districts are determined with reference to *one* phenomenon alone, which phenomenon is to be compared with the others, and then all the remaining phenomena are classified as regards place, according to the groups and districts thus determined. For instance, if it were desired to compare the infant mortality with the number of births, with the frequency of illegitimate births, and of still-births, and with the density of population, we should first determine the natural districts of the various grades of infant mortality, and then calculate, for these districts, all the remaining statistical circumstances which are to be included in the comparison. These groupings of the materials carried out for the purpose of comparison

constitute the experiments of statistics. By their means, in many cases, are we for the first time enabled to see whether the relations between different phenomena, which relations perhaps appear, on a general superficial comparison, to exist, have any actual reality. No general assertion can be made as to how large, or more accurately, how small the geographical sections should be, on the geographical method. Perhaps it is best expressed by saying that they should be *as small as possible*. With reference to the latter consideration, the condition that there should be a considerable mass of observations, supplies, as has been already remarked, a lower limit. The necessity that the mechanical work of reckoning should admit of being performed without excessive labour, acts in the same direction. If, for instance, we desire to calculate for Bavaria any statistical fact, such as the infant mortality just mentioned, and were to base our calculation on the parishes instead of the administrative districts, we should have to perform, in round numbers, 8,000 instead of 180 operations; not to mention that, in the case of the smaller parishes, in order to obtain aggregate observations we should have to trace the returns back through a long series of years.

The inferior limits of the sections, therefore, determine themselves according to the nature of the special problem, and cannot be laid down once for all. For the general facts regarding population, the treatment of which, on the geographical method, seems particularly desirable, sections of about 10 square miles (250 square miles English) might suffice for the circumstances of Central Europe. The applicability of the geographical method entirely depends in practice on the utilisation of small administrative districts, for which there already exist statistical compilations. If, for instance, the construction of natural districts is to follow from the statistical results obtained from smaller divisions, such as parishes or even villages, the elementary numerical work which is required for the mode of formation of the statistical geography alluded to, by means of a vast number of separate observations, will in almost all cases be impracticable.

With the geographical method of statistical inquiry is connected the cartographic representation of the results of investigation. At present we cannot examine this subject closely. The explanation of the modes of exposition employed by statistics, will subsequently lead us to a more detailed description of the nature and value of statistical cartograms.

The collective whole of the operations which make up the essence of statistical inquiry, may be divided into the following three groups :—

1. The aggregate-observation of the social facts.

2. The grouping and numerical treatment of the original statistical material obtained by this aggregate-observation.

3. The further scientific employment of the numerical materials of statistics, especially with a view to the establishment of the existence of regularities in social life.

The aggregate-observation of social facts forms the first step in statistical operations. The material for this process is unlimited; for every day brings into existence thousands of millions of new social facts. It is evident that all these millions of facts cannot for the purposes of statistics be observed and fixed, by entry in lists for further treatment. To this end such an amount of labour would be necessary, that mankind would be disturbed in the performance of the most important duties of life, by such an extension of statistical observation. In point of fact, under the head of "social facts," in the widest sense of the phrase, there are such an enormous number which are more or less indifferent as regards the information they supply as to social life, that an extension of observation to them would seem to be mere waste of human labour. On the other hand, there are also many social facts which are not altogether indifferent in the sense specified, but which are of such a nature that the trouble of observing them either bears no proportion to the value of the result to be expected, or else would be so gigantic as to be absolutely inadmissible. Let us imagine, for instance, that, for the whole people, the task is proposed of determining daily, as regards each individual, how much time is spent asleep and awake, eating and drinking, working and resting, standing, moving or sitting, and so on. Certainly a concrete solution of this problem would be a statistical curiosity of the first rank; but it is equally certain that no means can ever be found which could render possible the carrying out of such an investigation. But if statistical enthusiasm were to go further and demand an answer as to whether sleepers lie on their backs or on their sides, and whether they lunched at 12 or 1 o'clock, it might justly be said, that, though not altogether indifferent, such questions were open to the sound objection of being comparatively of small relevancy.

Of the great mass, therefore, of social facts of all kinds, only insignificant portions can be subjected to statistical observation. Moreover, the choice of the subjects of observation must not, of course, be made at random, but must above all things be made with regard to the import of the facts viewed as supplying information concerning social life.

It will certainly happen, in single cases, that facts of inferior moment will be noted, while others of more importance are disregarded. Such is the case, if other interests than those of sta-

tistics merely, for instance, those attaching to police regulations, require the determination of some fact of small importance socially, and if the material, when once obtained, is, for this sole reason, made use of by statistics.

So far the sphere of the facts which are capable of aggregate-observation is already extremely contracted; but the limits of observation are not even yet completely assigned. It is not possible, in the case of all the materials which are actually available for statistical observation, to devote unrestricted attention to all the real varieties among the single facts. Statistics seize on and level with a somewhat rough hand, many points of difference in the details of the separate phenomena, and only consider those qualitative differences in the subject of their observation, which can be firmly grasped. The statistics of marriage will assuredly not be content with a bare return of the number of marriages, but will draw distinctions, for instance, as to age and profession, religion, civil condition of the parties to the marriage; but will not give expression to the romantic or prosaic details of the motives to marriage, and the previous history of each separate couple.

If we inquire further as to the reasons which lead, in statistical observations, to the neglect of those qualitative differences in observed facts which are actually obtainable, we shall find that they are of two kinds. Such qualitative differences remain unnoticed, either because they cannot be quantitatively determined at all, and, therefore, are at the outset removed from statistical inquiry, or else because, though not in themselves incapable of quantitative aggregate-observation, they, after a real examination, would not increase our knowledge of social life at all proportionately to the labour applied. The same causes, then, which exclude numberless facts as such from statistical observation, enforce, in the case of others, a contraction of our attempt to comprehend their qualitative differences. In the case of a census, for instance, we should leave out of consideration the mental faculties of the population on the first, and the weight of the single individuals on the second, of the grounds here mentioned. Nevertheless, the opinions held by different persons and at different times, as to which of the different attributes of social facts that can be dealt with, are to be comprehended by statistics, are various. The censuses of to-day include much special information concerning the persons counted, which was not thought of half-a-century ago. In like manner the censuses of the future will probably put many questions which people at present are ashamed to ask. Even now a great difference is observable in the reception granted to statistical curiosity, according to the circumstances under which the returns are made. In the case of a general census, we are very cautious in

putting somatological questions, for instance, as to size, girth of chest, colour of eyes or hair, and of complexion; but we are by no means shy of asking such questions in statistics for actuarial purposes. We also find that the State is much more free to deal with persons liable for military service, even for statistical purposes, than with the persons to be counted in a census.

However far the collection of qualitative differences hitherto neglected may go, as the interest in statistics increases, these differences will never be completely observed. The defective side of all statistical inquiry, will always lie in the difficulty, when combining numerically observed facts, of so treating all the real differences of the phenomena to be determined, that nothing but similar units shall be included in the totality obtained. As a rule the multiplicity of the phenomena is so great, that the hope for complete similarity of the facts to be numerically combined in any statistical result must be altogether renounced. It is important to discover the proper point of view, from which the observer may lose sight of a sufficient number of qualitative differences in the observed facts, in order to effect the synthesis of the latter, which will then form one apparently homogeneous fact. An observer who adheres too closely to the details of the phenomenon examined, can never obtain a complete view of it; and he who desiring to obtain this complete view, remains so far off that he can no longer distinguish the light and shade in it, will obtain nothing but a general knowledge of the facts, which will warrant him in drawing few conclusions. In the first case, the observation will suffer from all the faults of short-sighted persons, who can well distinguish what is near, but fail to discern objects at a distance. In the second case, the error of the long-sighted man is apparent, who overlooks the details of an object situated near to the eye, and merely obtains a view, which is very clear and correct, but is deficient in details. The statist is always in danger of being too far-sighted; the so-called "practical man of experience," who looks only at isolated cases, runs the risk of becoming short-sighted. Hence they disagree as easily as a short-sighted person with one of long sight, who cannot understand why the former fails to distinguish the figures on a church clock.

Statistics do not supply *genre* pictures of social life. Their work is of a totally different character. They give a picture of the circumstances of social life in large and characteristic lines, on the basis of a multitude of observations, which are freed from the special character of any one point of view. The more or less subordinate details, which have no place in company with the marked features of the statistical picture, may well be given up for the sake of the great advantage which is to be found in dealing with large numbers of observations, and the guarantee these latter offer for

unbiassed conclusions. The statistician alone can disclose the large features of social life, since he frees himself from the disturbing side issues which beset a study of the single facts. In this respect he is like the traveller who places himself at some distance from the Alps, in order that he may rightly perceive the configuration of the mountain chain. The traveller also, must give up all very minute distinctions between field and wood, meadow and pasture land, but instead of these, he, like the statistician, obtains a correct picture of the grand features of the mountain system, which quite escapes the notice of anyone who finds himself in immediate proximity to the mountains.

If we examine the process of statistical observation more closely, we find that it may either steadily follow the stream of social events, or else may take place at considerable intervals, with a view to the delineation of the circumstances of society at a particular moment of time. The constant registration of births, deaths, and marriages, of immigration and emigration, of the commission and punishment of crime, and so on, belongs to the first of these categories; a census, on the other hand, to the second. These latter are termed simply *numerations*, in contrast to those constant registrations of certain social facts which rather resemble book-keeping. Intermittent numerations become necessary in all cases where an unbroken succession of observations is impracticable on account of the magnitude of the material, as well as of the labour and expense required. It is impossible to renew daily or weekly our numeration of the population of a country, and therefore we must allow a long interval to elapse between one such operation and the next. The physiognomy of the population, which is to be obtained through these from time to time recurring photographic operations, will serve as regards essentials, to represent the interval during which this branch of statistics is not active.

We must note a further and highly important distinction in the nature of statistical observations, according as the facts to be ascertained are completed, as events, before the eyes of the observer, or whether their collection implies the questioning of a third party. Of the first kind are statistics of criminality, which take their material directly from the records of the criminal courts; while a census or statistics of industry belong to the second kind. If the interrogation of a third party is necessary, the possibility of relying on the original statistical material depends largely on the good-will of the person questioned, who only rarely has an immediate interest in the statistical operation, and often has a superstitious dread of it.

It is a noteworthy circumstance that by no means all the observations of facts which supply statistical material are carried out entirely or merely for the benefit of statistics. Long before a science of statistics existed, there were systematic determinations of

social facts. There were, for instance, the ancient parish records, with their registers of marriages, baptisms, and burials. Even now the publication of marriages, births, and deaths in the civil register is treated as of high importance, not on statistical grounds, but chiefly in the interests of law and administration, though certainly the material collected from these motives is of the highest value to statistics. For the development of statistical science, this circumstance, that it found ready to its hand copious materials, previously collected for other reasons, which it could make the best use of, was of unusual importance. Had there been no parish records, the modern development of statistics of population could not have dated its origin from Süssmilch's work. The professional statist easily comes to be suspected, both by Government and people, of excessive curiosity; all the more desirable, then, is it, that other important reasons, besides the interests of statistics, should exist in favour of the systematic aggregate-observation of social facts. The German census could hardly have attained the development of which it can now boast, if it had not previously been necessary to obtain the numbers of the populations, in order to divide the customs revenues among the States of the Zollverein, and if the German Governments had not made inquiries into the magnitude of populations on certain public grounds, such as representation in the Reichstag, the peace strength of the army, and the assessment of the taxes. In these cases the statist is in the fortunate position of not having to propose an entirely new inquiry. It has been already granted on other grounds, and he has only to consider how the existing registers of facts can be made use of by statistics in a suitable manner. At this opportunity it will not be difficult for him to urge successfully an increase of the contents of the registers, which will be very desirable in the interests of statistics, though not necessary for the immediate practical end of the inquiry. The census arrangements of Germany offer a gratifying instance of this, for they extend in statistical details far beyond the measure of what would be absolutely necessary for the exclusive carrying out of the orders of the Government.

When once the interest of the State has been aroused in the promotion of statistics in general, as well on their practical as on their purely scientific side, it is possible to obtain the institution of inquiries solely for the benefit of statistical objects, such as returns of agriculture, and of the results of harvests, of the number, nature, and extent of industrial pursuits, and so on. In these cases the statist who has obtained the inquiry has a freer choice as to the nature and extent of the determination of facts to be made than when the scope of the inquiry is already more or less marked out by other motives.

In order that the determination of the facts may serve as a secure basis for further statistical operations, it is necessary that it should be correct in its totality, that is, complete and correct in regard to its individual parts; in other words, *sufficient*. There must be no deficiencies in the whole formed by the observed facts, and the observation itself must accurately determine each single fact. The completeness and sufficiency of the returns depend on many circumstances, some of which deserve mention here.

Above all, the nature of the arrangements made for the inquiry have great influence on the trustworthiness of the results. In any case, it is necessary that there should be a careful organisation of the machinery of inquiry, which in great statistical undertakings, for instance, in the modern census, embraces a very extensive region. Many thousands of enumerators must work at such an undertaking, and nothing which may concern the execution of their task should remain undecided. Whoever orders a statistical inquiry, ought therefore to think not merely of the scope and nature of the results which he wishes finally to meet with in the actual tables, but he must, above all, have a clear idea of the conditions under which the collection of the statistical raw material can be made securely, and on a uniform plan. The way has been opened towards a comprehensive improvement in the methods of statistical inquiry, by the repeated conferences of the representatives of official statistics, which have been recently held expressly as a result of the statistical congresses.

Next in importance to the arrangements made for a statistical inquiry, comes the condition that these arrangements should be comprehended by those who are entrusted with their carrying out, and by the public, whose cordial sympathy and co-operation should be enlisted. Very often a failure is due not to a want of excellence and care in the arrangements, but rather to the state of mind of the agents in the inquiry, and the public, towards statistics. These agents are in most cases functionaries and public servants who, often overloaded with the other work of their calling, and only slightly instructed in the nature and meaning of statistics, consider the inquiry into the problems set them as an objectionable piece of labour, or even as the disagreeable outcome of an incomprehensible curiosity in the higher Government circles. And even when there is no want of good will, as is the case with the volunteer enumerators who take part in a modern census, the capacity of the agents may leave much to be desired. It is even worse as regards the public to whose interrogation the inquiry is directed. The public, as has already been remarked, has frequently a thoroughly superstitious fear regarding the questions asked for statistical reasons, or even considers them as impertinent attempts on the secrets of individuals.

The peasant, who, for purely statistical objects, is questioned as to the produce of his grain cultivation, sees in this the forerunner of a rise in his taxes, and the lady of good society who is asked to give her age for entry in a census list, considers the question very impolite, and is not too conscientious in giving her answer.

Considerable improvement in this respect may be looked for, in the case both of the collectors and of those interrogated, from a wider extension of an insight into the nature and import of statistics. As it is, no one thinks any longer of promoting statistics by officious falsehoods, and still less will it ever be considered a glorious act to play statistics a trick by means of a safe lie.

The special intention of the statistical interrogation also has great influence on the earnestness and conscientiousness of the questioner and the questioned. For instance, we may conclude that the return of age in certificates of death will usually be more correct than in a census list. Before the coffin of the dead, many petty and frivolous motives cease to affect the members of the family, which may endanger the accuracy of the age return in the case of an enumeration of the living population.

Whether the returns asked for are to be constant, or are merely to recur at stated intervals, is of some importance as regards their probable accuracy. We may assume, that returns of the former kind are less laborious and disagreeable, both for the agents, and for those who are required to give information, than those statistical operations which only recur after long intervals. That births and deaths should have to be entered in a continuous register, displeases no one; but it is more or less startling to many of those concerned, that the magnitude of the population should be obtained afresh every five or ten years.

The formal conditions on which the return is made are not unimportant. From this point of view, it seems desirable that the most important and greatest of statistical operations, such as a census, should be carried out in virtue of laws. The absence of a basis of law will most likely foster the idea held by some people that they are the subjects of a sort of curiosity that is not quite justifiable. In fact the great statistical operations come in contact with the interests of the State and of the sphere of the life of the individual at so many points, that it seems highly desirable that there should be a legal basis for them, especially if they cannot unsupported extend their influence to all the multiplicity of detail connected with the technical part of the inquiry.

Even if all the conditions of a statistical return were to be as favourable as possible, the complete ideal of the aggregate observation of social facts will never be attained. For the very reason that we have to do with *masses* of observations mistakes in

the returns are inevitable. If we were to have the population of a whole country, or a great city, counted simultaneously by different agents, the results of the different returns made would differ to some extent the one from the other. The figures of statistics do not express the absolute truth, do not express certainty, but only a degree of probability; in the case of good observation, indeed, a degree of probability which nearly approximates to certainty. Herein lies no weakness, but rather a strong point of statistics, which they have in common with the exact investigation of the physical sciences. Ignorant men to whom the nature of statistics is unknown and repugnant, imagine that they can show them to be worthless by producing as evidence a single inaccurate observation, which they boast of having themselves occasioned. The history of statistical science shows that it passes from such attacks to the order of the day, and that the childish or malicious lies of single individuals affect but little the totality of statistical results. But if anyone comes and proposes to consider statistics, on account of the errors of observation to which they are well known to be liable, as inferior to other branches of knowledge, which are supposed to be free from such errors, the answer that should be made is, that it is an idle dream to imagine that other systems, and in particular those which rest on speculation, are free from perturbation produced by erroneous observations and intuitions. It is in fact certain that human speculation is much more richly furnished with errors than are the numerical premises of statistics. The difference lies in this, that these errors escape becoming known and criticised, while statistical science does not deny its errors, but strives honourably to restrict more and more the limits of error.

A special technical theory of statistical aggregate-observation has been only constructed gradually, and, to a large extent only in modern times. This technical theory manifests itself specially in two directions; in the skilful management of the mode of putting questions, and in correctly placing the answer in a written list.

In the case of great statistical operations, the proper settlement as to what questions shall be put in connection with the whole organisation of the business of the inquiry, seems a very comprehensive task. Let us take a census, unquestionably the most important of all statistical inquiries, as an example. *Who* are to be enumerated? The outsider replies, "the population." The statist objects, "but who are comprised in the population to be enumerated?" And on further analysing this question, he shows, that the apparently simple conception implied by the word "population," is in reality complex, and that, in carrying out the business of enumeration, we must sufficiently determine whether the persons who are present at the *place* of enumeration at the *time* of the

enumeration, or the persons who are *residing* in the place mentioned, are to be counted, or, again, whether *all* who have certain *bonâ fide* relations with such place, are to be counted. Having further decided when the enumeration is to take place, and what information concerning the individuals enumerated (such as name, age, religion, &c.) are to be added, it is necessary to arrange for setting the work of enumeration on foot, and especially to obtain the large number of enumerators which is desirable for this purpose. The direction and carrying out of the system of statistical interrogation is therefore an important branch of the technical theory of statistics.

The best system of interrogation is of no use, unless care is also taken that the answers made may be correct, and placed in a form which is suitable to further statistical treatment.

This form can only be obtained in a written register.

The records which contain this registration we call a filled up form of return (Erhebungs Formular). The forms of return are either lists, or papers* (Zahlkarten). We have lists, when, in one record, many single facts, belonging to the statistical return in question, are registered in succession. A register of the civil State, in which the births are entered successively is, when considered as statistical raw material, a list. And the same of the householders' lists employed in a census, in which all the members of the household are entered one after the other.

Every form of return, on the other hand, which is devoted to a single observed fact alone, is called a paper. If for instance, a householders' list is divided into single documents, each of which only contains the information obtained regarding one individual, such a document is a paper. Papers have undeniably been used as forms of return much more frequently of recent years than formerly. It is impossible to state in general terms whether lists or papers are best; this depends on the special characteristics of the case.

The careful planning of the form of return is an achievement of the most recent development of statistics. Many old statistical returns struggle under the want of a distinction between forms of return, and forms of concentration. This is especially the case with the comprehensive returns, by means of which the various Governments, stimulated by Napoleon's example, strove to obtain a more complete knowledge of the conditions of their States and populations. The desire to procure as quickly as possible all they wanted to know, left no time for a careful determination of the method of inquiry. They were satisfied with specifying the nature of the grouping, in which the results of the return were finally to appear, without raising the question of the nature of the primary form of interrogation, that is, they devised forms of concentration,

* Or "cards."

but no forms of return. The careful treatment of this latter important branch of statistics has been coming gradually to the front, down to the most recent times. The industrial statistics of the Zollverein are even now, in the seventh decade of the century, produced without the aid of a distinction between the form of return and the form of concentration. It is clear that such returns are greatly defective. The less we make plain to the agents of the inquiry, the road they ought to follow, especially if a correct and comparable net result is required, the less ought we to wonder if they miss this road.

Finally, it is worth while to consider the question who is to fill up the forms of return, the interrogator or the person interrogated. There are inquiries, in which, from the nature of the case, only the person interrogated can give a correct answer in writing. Among these are returns of financial statistics, which are required from savings banks, companies, school authorities, vestries, and so on. In such cases, answers given in writing by the persons questioned have long been the rule. In modern times, however, this plan has become usual even in cases which concern the whole population, and therefore in a census, the supplying of answers for the lists, or the papers, by the separate heads of households, is naturally the next step, whenever they can and will write. This system of "enumeration" has developed itself especially in the case of the German census.

The grouping and numerical treatment of the statistical raw material, obtained by aggregate-observation, forms the second step in the carrying out of statistical operations. The problem is so to use the material obtained by observation, in the form of registers, lists, and papers, that we may obtain a clear and easily understood picture of the individual facts, as determined, with regard to their specific qualitative differences, by that observation. The material obtained by a census, in the shape of householders' lists, with their register of the names of the members of the household, with the addition of their ages, professions, &c., is as far from being the statistics of the population, as a heap of building stone from the quarry is from being a house.

This clear and comprehensible picture of the results of observation must, for the purposes of statistical inquiry be given in numbers; and the orderly summary of the numerical results obtained from the raw material are called "tables." In statistical tables, the material obtained must first be surveyed with regard to the *absolute* numbers it supplies. The orderly tabulation of the numerical material, therefore, precedes further labours of calculation, which are specially adapted to the evolution of what are called *relative* numbers. We may call the former primary, the latter secondary

tables. For instance, a table showing the number of inhabitants in a province of a country, and the varieties of their religious beliefs, would be a primary table. If on the other hand there were another table in which was shown not the absolute number of the persons belonging to each religion, but the percentage of the population formed by each religious sect, this would be a secondary table.

We shall speak of the most important reckoning operations, which are performed on tables later. We shall now deal with statistical tables as such, and with the technical handling which is necessary for their construction from the original material.

Statistical tables contain a numerically accurately composed synthesis of the observed social facts. Synthesis and grouping of the observations are alike necessary at this stage of statistical operations. The raw material of statistics, as produced by the process of observation, consists of isolated determined cases, which have to be combined in accordance with the resemblances among the facts observed. The separate facts must be treated with regard to their observed qualitative differences among themselves, that is the tables must be *sub-divided*, even if the chief conclusion of the table can claim of a general and comprehensive nature without securing attention for the various qualitative differences which are included in the respective divisions. Supposing, *e.g.*, we are dealing with statistics of the religious beliefs of a population. In this we go through the householders' list one by one, and place in a separate division of the table, the number of persons belonging to each sect. In addition to the results of these subdivisions of the table, we must indicate the total number of the population, without further considering qualitative differences with regard to belief.

If several qualitative differences are to be exhibited in one table, we get a *composite statistical table*. This is the case, when, for instance, the sex, professions, and religions of a population are exhibited in one table, without these three kinds of qualitative difference being combined with one another.

The subdivision of a statistical table is performed on two essentially different principles. It is either a grouping of the facts according to their special characteristics, *i.e.*, a division of them according to their internal differences, or it is a *grouping with regard to time and place*, of simple facts, or perhaps of facts which have been subjected to internal combination. We have a grouping of the first kind, when the whole population of a country are distinguished according to age, sex, civil state, professions, &c. On the other hand, when the births and deaths which occur in a country during the year, are distinguished according to the calendar months and the districts they occur in, we have a grouping of the second kind.

Both modes of statistical grouping are of equal importance. It is evident that the grouping according to fundamental differences, is the first operation which brings with it the more profound knowledge which is necessary for statistics. We have already said all that is needful as to the importance of correct grouping with regard to place, while treating of the geographical method. It only remains therefore, to say a few words about grouping *in time*. This of course only takes place in the case of a constant series of observations of such social phenomena as are continuous, and not in the case of statistical pictures taken at a point of time, which, at all events in theory, do not extend in time at all. Whenever a grouping in time occurs in statistics, it has this great advantage over a grouping in place, that divisions of time are well-known and are possessed of a similarity to one another, which is altogether wanting to the divisions in place. Districts A and B will always be portions of space which differ in character more or less, but the first and last day, and the second and third week of a year, are, respectively, perfectly similar divisions of time. Besides, for the civilised world, every day in the calendar, and every year in the calendar forms a well-known fact of the first rank, while a sufficient knowledge of any one of the space divisions which form the foundation of statistical observation, is only common in the narrowest circles, even when the subject in question is merely its superficial extent. It will be understood, that this being the case, comparative statistics work under more favourable circumstances in the matter of time than in that of place. Moreover, in the former case the perturbations are less. We have chiefly to remember the variety of calendars in use, and the unequal lengths of the months. But even these anomalies are well known, and can therefore be easily taken into account in statistical comparisons. This is, it is true, not always done even when it might be effected without any trouble. This is the case when the death-rate is calculated and comparisons made with reference to the calendar months without regard to their differences in length.

For the procuring of the raw material which is necessary to the attainment of the figures for a tabular statement, a special technical theory has been developed, for which we have chiefly to thank the statistical bureaux. The old method of converting the raw material into the tabular form, was that of employing strokes. It consists in this, that the table, with all its columns, is prepared on a large scale, and then each separate fact in succession is marked by a stroke in that column of the table which has the heading under which the fact in question comes. When all the material which is to compose the table has been gone through, the strokes in each division are counted and the totals thus obtained are subjoined.

This method, however, is only available so long as the operation is either a mere primary process, or the construction of a table which contains no comprehensive statistical combinations, and therefore has only a small number of columns. But as soon as the columns and rows of a table become numerous, the employment of strokes is clearly a tiresome and also a highly untrustworthy method of treating the raw material of statistics. At the present day tables containing strokes constructed on a large scale, would be so very bulky that they would cease to be manageable, and errors in finding the right column from among hundreds of such columns become more and more frequent. It should be remembered that the combinations that may be made among the age (by single years), sex, and civil state of the population would give about 800 columns of our table. If we reduce the classes of age to twenty, and add a set of 300 kinds of professions, which is by no means the limit of the details that might occur in statistics of professions, we get 48,000 rows. To find the right row from among these for each stroke on the plan of marking by strokes, is impossible without great expenditure of time and without making mistakes. Recently another method has been invented for such cases as this, namely, the treatment of the statistical raw material by means of *leaflets*. The technical theory of this method is briefly the following:—From the registers of facts which the inquiry supplies, the returns which are to be employed statistically, are extracted for each single fact, and entered on a separate leaflet of moderate size. These leaflets are then sorted into heaps according to the points of view which the grouping of the table that is to be constructed implies. When all the leaflets have been gone through, the heaps are counted and the numbers thus obtained are entered in the table. This method admits of the greatest multiplicity of statistical combinations without necessitating any proportionate trouble, since in the case of problems of an intricate character a division of labour is possible. After the preliminary distribution of the leaflets according to general differences, there may follow a further sorting process, carried out with a view to such differences of detail as it is necessary to note. The work of sorting can be materially lightened by fixing on different colours for important differences in the observed facts, such as sex and civil station in the case of a census.

If the inquiry has been made by means of papers, *i.e.*, separate forms of return for each fact, these could be used for the primary process as leaflets, without further trouble. But in this case a certain amount of technical difficulty is produced by the circumstance that such papers are usually of much more considerable size than the leaflets would be, and that it is harder to make use of

differences in colour on this plan, so long as their filling up is left to the public.

The peculiar process which is necessary to the production of well arranged tables, from the scattered lists of facts which form the raw material, and which, in the larger operations of statistics, almost resembles one of the manufactures, may be called the technical process of statistics. It appears in all statistical work. Such a process can only be carried out to any large extent by the employés of a statistical office. It has already been remarked, that the absolute necessity that the more important statistical inquiries should receive the fullest assistance from the authorities of the State, has led to the rise of official statistics. I may add that the same assistance is required for the technical treatment of the material, as for the procuring of the returns, as soon as the material in question becomes at all considerable.

A question now arises which is not unimportant in itself, and is of the highest interest as regards our knowledge of the modern development of official statistics. It is, whether the technical process of statistics which is directed to the transformation of the raw material into the tabular form, should be *centralised* or *decentralised*. This process is *decentralised* when the authorities charged with the returns themselves, or their subordinates, who only have to deal with the material from small districts, have to construct the statistical tables. On the other hand, the process is *centralised* when the collection of the raw material alone falls to the part of the subordinate servants of the administration, while the tabular treatment is handed over to the centres of statistical work.

Decentralisation is the older, centralisation the more modern method.

The advantages of centralisation are briefly the following:—The subordinate authorities are released from the task of constructing complicated statistical tables, which is very wearisome to them, and not at all suited to the nature of their regular business. By means of centralisation, those persons who have a real and constant interest in the proper treatment of the statistical materials, are reserved for the technical work of statistics. Further, by this method alone can that uniformity of treatment be secured, without which a proper working up of the material is not to be expected. Only by a supervision of this process by a statistical centre, can the full utilisation of the return, by the construction of tables with many subdivisions, be expected. Decentralisation in the making of statistical tables answers to production on a small scale, centralisation to production on a large scale.

In the latter case the principle of the division of labour is fully carried out, and insures the greatest uniformity, quantity and

cheapness of production. The same is true in the case of the technical process of statistics. For instance, under centralisation, the method of treating the raw material by means of leaflets is quite in place, while it would lead to the greatest errors if it were applied separately by various administrative authorities who are not versed in this technical process.

On the other hand, it cannot be denied that centralisation brings with it certain disadvantages. The magnitude of the material which, on this plan, will arrive at the statistical centres, might be a hindrance to the careful testing and correction of the registers. Against this we may set the fact, that a central statistical office, which will have the greatest experience in regard to the errors and mistakes which occur in statistical returns, will most easily discover them. And this reflection will induce us to take care that there be no want of sufficient vigorous supervision of the raw material. Whether this purpose may be best effected in large countries, by means of the appointment of separate provincial offices, or by arming the central office with suitably increased powers, may be left undecided. A further disadvantage of centralisation is that the local peculiarities of the various parts of the country, are but little known to the central office. But a remedy for this may easily be found, in the introduction of assistants from the various districts, as well as in the use of information in writing. Moreover, even on the decentralised system, there is no guarantee that, at the sittings of the local authorities, more than one person, who is quite familiar with the circumstances of the district, will really take any trouble about the tables. If it is asserted that provincial officials will, if the technical work be centralised, lose sight of the facts concerning their own district, and be obliged to obtain them by a circuitous process, by means of the central statistical office, this assertion must be admitted. But the only requirements that will be affected are of small extent, and can be easily satisfied if those concerned really desire it. Finally, the question has been raised whether the directors of statistical offices, do not, under centralisation, lose in power of proceeding with their scientific labours. It is true that anxiety for the proper working of the statistical machinery, robs the manager of a central statistical office of many hours which would otherwise be quietly devoted to statistical inquiry. Nevertheless, I consider this drawback as much less than the advantage which arises from the constant handling of the original materials.

A discussion of the advantages and disadvantages of the centralisation of the technical processes of statistics, thus makes it clear that the balance is decidedly in favour of the former. The tendency which is observable in official statistics, towards extending this centralisation to departments over which it has not as yet obtained

a hold, is a very right one. This presupposes, on the one hand, the complete separation of formulæ of collection from formulæ of concentration, that is, of the work of collection from the work of synthesis; and, on the other hand, it presupposes that the statistical offices will be better supplied both with workers and with money.

Having concluded our remarks on the grouping of facts, as the second step of statistical operations, it now remains to glance at the work of reckoning, which is partly necessary for the immediate working up of the statistical raw material, and is partly required in subsequent operations.

The simplest arithmetical operation of which any extensive use is made in statistics is addition. Every primary statistical table whose columns are filled with absolute numbers, is the result of a series of additions. If the individual facts have been classified they must be added up, and finally there must usually follow a general summing up of the separate summations contained in the divisions of the table. If, for instance, we desire to obtain statistics of the age of the population, we classify the separate individuals, by means of the system of strokes, or that of leaflets, by single years. Then we add up the strokes or leaflets which belong to each year, and thus finally obtain a general total for the whole population. Correctly speaking, elementary statistics know of no other arithmetical operation than summation. But as soon as the further scientific treatment of the statistical material is included in our views, some other arithmetical operations come into prominence, which are so directly connected with the very existence of statistical tables, that it will be judicious to allude to them at once, although it cannot be denied that they form, to some extent, the point of commencement of the highest division of statistical work. These reckoning operations are:—

1. The striking of averages.
2. The obtaining of figures for oscillation or fluctuation, such as minima and maxima.
3. The attainment of relative or reduced figures.

The calculation of *averages* is so usual an accompaniment of statistical investigation, that even those who are not familiar with this department of knowledge, will easily imagine the endeavours of the statist to procure average numbers. Every average presupposes a series of observations, whether these follow one another in *time*, or are distributed in *place*. The *average* of a series of numbers, is that quantity which results, when the total result contained in the series is equally distributed among the members of the series. If, for instance, in any place, on the separate days of one week, there were born 14, 22, 24, 19, 13, 27, 21 children, the figure 20 expresses a number of children born, which, if it had appeared

regularly every day, would have given the same total, namely 140 children during the week. The number 20 is in this case called the daily average of births.

Arithmetically simple as is the process of striking an average, yet errors are of frequent occurrence in it. If, for instance, we find the average by dividing the sum of the series by the number of its members, we must take great care to have a right comprehension of what the number of the members is. Superficially many or several members will often appear condensed into one, which one member ought, in taking a correct average, to be counted as several. In other words, the similarity of the members must above all be secured. If, for instance, the grain market statistics of a place show, that 30,000 quintals of wheat were sold at 8 florins, and 1,000 quintals at 4 florins, and supposing the average price of wheat is to be obtained from this, we must remember that we have here not merely two observations, but taking account of similarity, a series of 31,000 observations, each of one quintal of wheat. The total price realised by the wheat, namely 244,000 florins, must therefore be divided by 31,000. We thus get 7.87 florins. This is the true average price, and not 6 florins, the arithmetical mean of 8 and 4. If we do not analyse the total into 31,000 distinct observations, we must at any rate be sure that each member of the series, as it appears superficially, shall be weighed, in reckoning the average, in accordance with its quantitative importance, *i.e.*, in the present example, the price of 8 florins must be counted thirty times, and the price of 4 only once. This arithmetical result is the same as the last. In modern times, the average as corrected with regard to the relative importance of the separate terms of the series, is called the *geometrical average*, while that obtained without regard to this relative importance is called the arithmetical average. It is clear, that as far as possible, geometrical averages should be obtained. This mode of calculation is not, however, possible, in all cases, particularly when the relative importance of the members of a series is altogether unknown. When, for example, the average price of the means of subsistence for a particular year is to be calculated, the daily and weekly price of the article in question being known, but not the amount of the sales of it, we must be content with the arithmetical average.

A deeper insight into the nature of statistical averages is obtained, when it is realised that they fall into two groups which differ essentially in character. 1. The average may be a *special type* of circumstances and phenomena, which in their actual reality do not as a rule exactly correspond to this average result, but which approximate to it more or less closely, and in some cases absolutely coincide with it. For instance, if we have obtained the averages of

the births and deaths in a certain country, for a period of twenty-five years, we may consider the averages obtained as types of the contingents of births and deaths respectively for each year. It is also not inconceivable, though not very likely, that in the twenty-sixth year these numbers should be exactly attained. On the other hand, it is highly probable, that the contingents for this latter year will, if no unusual events occur, approximate respectively to these average results.

To this class of statistical averages is opposed another group of average results, which we cannot speak of as supplying a type of phenomena, and which should rather be considered as *abstractions* obtained by reckoning. If, for instance, we find from the results of a census, that the average age of the population of a certain country is twenty-eight years, this is to all appearance, and as an arithmetical result, just as much an *average* as the yearly rate of births or deaths above mentioned; but in reality it is something totally different. An age of twenty-eight years is by no means typical of the ages of the persons of whom the population is composed; indeed it is quite inconceivable that a population should exist, whose members were as a rule twenty-eight or approximately twenty-eight years old. In this case the average result obtained is only an abstraction, which has nothing whatever in common with the real circumstances and phenomena.

It is scarcely necessary to adduce any further reasons, why, of these two groups of statistical averages, the first has a much higher claim to scientific consideration than the second. It need only be remarked here that averages which cannot be treated as types, must, for the purposes of science, be handled with great caution, if they are not to lead us to delusive conclusions. Since they are only arithmetical *abstractions*, they may, even in the case of identical results, arise from very different, or possibly from quite opposite, phenomena. The same average age might be obtained, for instance, for two countries, of which the one contained a large number of old persons and children, while the other was largely composed of persons in the prime of life.

A good illustration of the special value for statistics of the calculation of averages, has already been given as an introduction to the explanation of the geographical method of statistics. Here it need only be remembered, that the peculiar value of the average, in eliminating differences of time and place, consists in this, that instead of complex series of figures, which are hard to grasp in their scientific import, the average gives us a brief expression, with which it is much easier to work, and which offers a primary general insight into the actual condition of things.

Nevertheless, the discrepancy between the magnitude of the

average, and those of the single results of observation, which vary in a thousand ways, is too great for the attainment of the average alone to be sufficient. A middle term, obtained from the calculations, is necessary, which does not coincide with the amount of the average, but renders the multiplex character of the series of observations scientifically comprehensible and comparable, by means of giving prominence to special points in them, and obtaining a short expression for the characteristics of the oscillations which therein manifest themselves. The obtaining of figures for oscillation or fluctuation, such as the minima and maxima of a series, serves this purpose.

The average obtained from a series of separate results, as has been remarked, certainly gives us a short expression, which is easily employed for further scientific work; but it is not by any means enough to give us a more profound knowledge of the statistically observed facts and phenomena. For this end it is necessary that a short expression should be obtained for the amount of the fluctuations above and below the average, which the separate results show. For instance, the same average may arise from two series of figures, which are entirely different as regards their fluctuations. This difference in amount of fluctuation, is, together with the average, of peculiar importance in determining the character of a statistical phenomenon. If we only look to the average, an important element is disregarded. As to the obtaining of identical averages from different separate results, the following example will suffice. Suppose that, in ten consecutive years, the number of births runs thus:—

In the Town of A.	In the Town of B.
4,800	2,000
4,900	3,000
5,000	4,000
5,100	5,000
5,200	6,000
5,100	7,000
5,000	8,000
4,900	9,000
4,950	4,000
5,050	2,000

Here the yearly average of births is, in each town, 5,000. But the statistics of birth for the town of A are certainly utterly different from those of the town of B, in spite of their having the same average during ten years. The latter town shows a considerable, the former only a moderate fluctuation, in its contingent of births. It is very important to obtain a short expression for the amount of this fluctuation, as compared with the average. The figure for oscillation or fluctuation supplies this requirement. It shows the

average deviation of the separate results of a series of observations, from the *general average of the series*, and, for this purpose, is expressed as a percentage of this general average itself. If we wish to calculate the oscillation figure for the two series of numbers given above, we proceed as follows:—

The deviation from the yearly average (5,000) in the ten separate years, runs thus:—

In the Town of A.	In the Town of B.
200	3,000
100	2,000
—	1,000
100	—
200	1,000
100	2,000
—	3,000
100	4,000
50	1,000
50	3,000
<hr/>	<hr/>
900	20,000
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The average yearly deviation is, therefore, for A, 90, for B, 2,000. Since the *yearly average* of the series is in each case 5,000, the mean oscillation about the general average of the series, is, for A, only 1·8 per cent.; for B, on the other hand, 40 per cent.

Since exponential figures are not required in statistical tables, the position reserved in mathematics for these figures can be utilised, in order to supplement those averages for which the mean oscillation is calculated, by the addition of figures for that purpose. In the present case, then, we shall simply say, that the yearly average of births amounts in the town of A, to 5,000¹⁸, while in the town of B, on the other hand, it is 5,000⁴⁰. We can then perceive at a glance that in these two towns we have to do with averages which are arithmetically identical, but in reality of very different natures. Especially we can at once judge, from the oscillation figure, whether the average obtained can be treated as approximately a type of the particular phenomenon. The smaller the oscillation figure is, the more is this the case; and the larger it is, the less can the average be a type. The oscillation figure of any series can be obtained *arithmetically*; but it can only have statistical value on condition that the separate numbers of the series are similar. If we were to calculate the oscillation figure for the different numbers of births in the administrative districts of a country, this result would be worthless, on account of the unequal magnitude of these districts. We should first have to establish the requisite similarity among the members of the series, by a comparison of the births with the whole population, or perhaps with the

number of women capable of bearing children. It will now be understood why the attainment of oscillation figures is peculiarly suited to series of observations which are periodical, and therefore have the advantage of complete similarity as regards their separate parts.

It may be alleged against oscillation figures that similar averages combined with similar oscillation figures may be obtained from different sets of single fluctuations. This is true; but it may be replied, that in following out further the details of the fluctuations, we return to the separate study of the single members of the statistical series. This study will always retain its special value, and can besides be illustrated by the method of graphic representation in the case of series composed of many members. But our present object is to become acquainted with the reckoning processes which, by means of figures alone, subject the hardly manageable complexity of statistical series to quantitative determination. And, from this point of view, the value of oscillation figures is unsailable.

Nevertheless, it cannot be denied that it is also useful to obtain, and bring into prominence, the two members of a statistical series which represent the observed maximum and minimum. If this is done, we have in addition to the measure of average fluctuation included in the oscillation figure, the extreme superior and inferior limits, within which these fluctuations occur. In the above example, accordingly, we should have to supplement the average of births for the town of A, viz., 5,000¹⁸, by the additional statement, "maximum, 5,200; minimum 4,800;" and to supplement the average of births for the town of B, viz., 5,000⁴¹, by the additional statement, "maximum, 9,000; minimum, 2,000." We may prefer, however, even in this case, to express the deviations of the maximum and minimum as percentages of the average, and to say, accordingly, "In A, the average of births is 5,000¹⁸; maximum 4 per cent., minimum 4 per cent. In B, the average is 5,000⁴¹; maximum 80 per cent., minimum 60 per cent."

The material value of an average can hardly be further elucidated by means of figures, without impairing the clearness and intelligibility of the conception.

The last group of reckoning operations, through which statistical tables must be prepared for further scientific use, consists in the evolving of relative or proportional numbers from the series of *absolute* numbers that have been obtained directly from the returns. The object of this operation is in all cases to render easy of comprehension the numerical relations which, in the primary absolute numbers, appear as minute quantities which are hardly available for purposes of comparison, by reducing them to *simple numerical*

expressions, formed with special regard to multiples of the number 10. In so doing statisticians only make use of a method which is usually employed by business men, as, for instance, when the interest of a loan is stated not in terms of the amount of each item of accrued interest, but as a percentage of the capital lent.

Lastly, the proportional figures employed in statistics may be divided into two groups. We have a case belonging to the first of these when the members of a statistical series are to be made easily comparable with the total of the series. Let us suppose that in the country A, there are, out of 27,314 crimes, 1,900 in July and 2,789 for January, and in the country B, out of 76,218 crimes, 5,117 occur in July and 7,639 in January. The rates for January, as compared with the total number of crimes for the year are $\frac{2,789}{27,314}$ and $\frac{7,639}{76,218}$; those for July are $\frac{1,900}{27,314}$ and $\frac{5,117}{76,218}$. From these numbers we certainly perceive that in both countries the January rate of criminality is considerably greater than that of July. But we cannot tell from these four vulgar fractions with numerators and denominators that are not powers of ten, how far the two countries A and B differ in this respect. We can, however, ascertain this at once if we transform each fraction into equivalent ones with decimal denominators, and call the rates of criminality for January 10·2 and 10·0 per cent., and those for July 7·0 and 6·7 per cent. In these two cases the number 100 is adopted as the denominator. We might have chosen to represent the total, the components of which we desired to make easily available for comparison, by 1, 10, 1,000, 10,000, &c. But the use of the number 100, *i.e.*, the expression of the relative amount of the parts by means of *percentages* is most common. So much is this the case that, by a misuse of language, percentages are spoken of even when some other round number than 100 forms the common denominator. Accuracy requires that in such cases we should speak of so many *per mille*, or per ten thousand. Besides, there are good reasons for the general employment of the method of *percentages* in the stricter sense. In most cases, where parts are compared with a whole, the number 100 is neither too large nor too small. It is only when we have to deal with a very long series of separate numbers of very various magnitudes that the numbers are reduced not to hundreds, but to thousands or tens of thousands. It may be added that, for purposes of comparison, it is of no importance which power of ten is chosen, since in changing the base we simply have to shift the point in the decimal fraction already found. On the other hand, it must be said, that the public whose dislike to rows of figures is great enough already, will be still more frightened away on finding that it no longer meets with totals, but tenths, or even hundredths or thousandths, in the form of decimal fractions.

The second group of proportional figures occurs in statistics, when the object in view is not, as in the last case, the comparison of numbers representing parts with the total, but the comparison of figures, which have been given by different inquiries, with one another: as when the number of births is to be compared with the population, or the latter with the extent of land in cultivation. In this case also the operation is effected by taking one of the numbers to be compared as = 1, 10, 100, 1,000, or some other power of ten, and then calculating the other. The most useful methods are, that of percentage, and of reducing to unity one of the numbers to be compared. For instance, if the country A shows 818,162 births in a population of 20,314,716, we obtain 4.03 births to every 100 inhabitants, or 24.95 inhabitants to one birth. Both modes of expressing the fact are correct, but of late the preference has been given to the former. On this plan the rise and fall of the proportional figure takes place with the increase and decrease of the observed phenomenon (the frequency of births in the present case). On the other method of calculation the figure rises in value when the frequency of the phenomenon diminishes, and falls in value when it increases. In the above example the number gains in magnitude when births diminish and *vice versâ*. This produces a certain amount of confusion in the reading of statistical tables, and therefore the Congress at the Hague rightly declared in favour of the first mode of calculation.

The task of statistics is not yet completed when the facts of social life have been observed, the results obtained placed in the form of tables, and the further arithmetical treatment of these tables performed. There still remains a further labour to be gone through, which alone gives to statistical inquiry its full scientific value. If the information obtained by means of the returns themselves is the raw material, the tables may be regarded as the middle stage of the manufacture from which the finished scientific article is produced by further labour. This further scientific work consists in the demonstration of the conformity to law and order which exists in the mass of phenomena constituting the facts of social life. Certainly social life is a stranger to laws, that is, to physical laws in the narrowest and most definite sense of the term. The phenomena of society show a manifold variety in their subjective character as regards both time and space, which is wanting to physical laws in the strict sense. There are, however, in the realm of physics phenomena which resemble the facts of society considerably in this respect, and in which, therefore, we may perceive relations, which are not exactly laws properly so-called, but are nevertheless very important uniformities and regularities. The facts of meteorology distinctly belong to this class. The dis-

cussion whether we ought to speak of "statistical laws" or merely of "uniformities" and "regularities" is a barren logomachy. If the regularity, or uniformity, is constantly so great that in a given case, under similar circumstances, the recurrence of a similar phenomenon is to be expected as in the highest degree probable, we are at liberty, even if mathematical certainty is not possible, to speak of a statistical law. In the case of inferior degrees of probability a more qualified expression is, no doubt, suitable.

At all events, the laws revealed by statistics are not laws concerning the future, but concerning the present and the past. The laws whose investigation is the highest work in the domain of statistics are not laws *à priori*, but experimental laws. They explain to us the whole phenomena as it appears when set free from the accidents which belong to the individual concrete phenomena. The laws of statistics are nothing but short general formulæ for expressing the apparently incomprehensible multiplicity of the phenomena of social life, and the actions and reactions which occur among those phenomena. A single example will suffice. Hardly anything is so uncertain for any individual as the time of the arrival of his own death. The greatest variety of causes are at work to determine this event, and frequently the actual approach of death is the consequence of blind chance. It would therefore be in vain to prophecy regarding the time of the decease of a single individual with any prospect of hitting the mark. But if the whole aggregate of individuals is put in the place of the individual, the case is altered. The apparent influence of chance is still powerful to affect the lives of individuals; but out of the combination of large masses of apparently irregular units there arises an image of regular organisation. We can definitely assert, on the ground of the most general experience, that a generation of beings born—say 100,000—will, in the second year of their life, already have suffered a considerable diminution of numbers, and that it is absolutely impossible that the whole 100,000 should attain their tenth year. Further observations will show a more or less general regularity in the larger or smaller proportion lost from year to year by a generation as its age advances, until at length only isolated fragments of it are left, which will soon, in their turn, become the prey of death. That which is an inscrutable phenomenon in the case of a single individual, is a regular and easily cognizable phenomenon in the case of the aggregate. Death, the time of which cannot in ordinary cases be predicted for an individual with any certitude, takes place among masses of men in conformity with the well-ascertained course of the laws of mortality.

This regularity in the phenomena of the aggregate, side by side with a, to all appearance, complete want of regularity in those of

the individuals is, moreover, not at all peculiar to the social life of man, but is exceedingly common in the realm of purely physical phenomena. One of the simplest examples that can be given is supplied by every fall of snow. The point at which any given snow-flake reaches the earth appears to be determined by pure chance, and yet the stratum of snow which we find after a fall, which has not been disturbed by the action of the wind, is of uniform thickness over wide surfaces. Of two adjacent square metres we do not find one heavily loaded with snow and another free from it. The phenomena are similar in the social life of man. Here, too, it is evident that the discovery of a certain probability regarding the occurrence of a given result, implies, as a matter of fact, a proportionate frequency in its actual occurrence. When this simple law of the social life of man was first discovered, and was found to hold even in the case of those acts which appear entirely arbitrary, people were astonished, since the new fact was not reconcilable with the ordinary conception of the freedom of the will. On a more careful consideration of the matter, it is plain that this regularity in the phenomena of aggregates is natural and self-evident, and that, on the other hand, want of regularity in these phenomena would be a cause of astonishment. Given a particular probability of an event, the natural law is the occurrence of this event in a similar proportion. In the case of the surface which is exposed to the fall of snow, there is an equal probability that adjacent square centimetres will be covered, just as there is the same probability of diminution by death for two different groups of a population, provided their physical and social conditions are identical. If the degree of probability has altered from what it formerly was, the similarity of results no longer holds. If a strong wind blows, the probability of being covered is greater for places protected from the wind than for those which are exposed to it, just as the mortality among the lower classes of the people, whose circumstances are unfavourable, is greater than that of the rich, who live in healthy dwellings. At a given hour of the day the traffic which passes through any given length of street may be expected to be constant under similar circumstances. All the inhabitants of the city will not, without some reason, either avoid the street at that particular time, or throng to it in large numbers. The same number approximately will appear in it day after day. But if any unusual event occurs, such as a procession, which moves through the street in question, the regularity is gone. The events of social life, especially the volitional acts of men, are in the same category as a fall of snow and the traffic passing through a street.

I must specially point out, that in all cases of statistical laws it is necessary to treat the individual as an abstraction. Man only comes under our consideration as a mere fragment of the whole

species. Statistical laws hold for the fragment, but as regards the individuals composing it they are a mere delusion. Each individual does not supply the quota of crime which he ought, according to the rate of criminality, to commit, and neither does he die on attaining the average age of man. During the process whereby an abstract statistical law is converted into the concrete facts of the life of the individual the happiness and misery, volition and counter-volition of these individuals is at work in infinitely various ways, without really much altering the net result. The statistical laws obtain their victims; only it is impossible to determine beforehand which of the individuals will be the victims; if one is not sacrificed, another is.

One of the most important efforts of modern statistics has been the investigation of the so-called "average man" in his physical and psychical relations. In reality, there is no "average man." If statistics could ever obtain a complete determination of him, he would form a general type of the infinitely various single phenomena belonging to the species man. The greater the extent of an observation of social phenomena, the more it possesses the character peculiar to statistics, and the more probable is it that the observation will lead to the establishing of a uniformity of social life, even if the law so discovered is not found to involve an unalterable fate for the individual man. The fact that aggregate observation is essential to this process is expressed by what is, with tolerable correctness, called the "law of large numbers." The nature of this law has been excellently stated by Süßmilch, the author of a work which appeared in the middle of the last century, entitled, "The Divine Order in the changes occurring in the Human Race, proved by means of the Births, Deaths, and Propagation of Man-kind." In the heading of Section 15 of the first chapter he says: "A peculiar characteristic of this order will be shown in that it (the order) is concealed by the absence of order in small collections of facts, and can only be brought to light by means of large assemblages of lists obtained from numerous small places, and during many years, and this is why it has remained unknown to former philosophers."

Statistical laws may be divided into two groups. They are either (1) Laws of Existence and Development, or (2) Laws of Causation.

We meet with laws of existence and development, when we bring out the typical effects of all causes which determine the character of one single specified phenomenon. If a single isolated group of facts forms the subject of the observation, the law investigated is one of existence. If it is a case of a succession of facts of the same kind, the law to be determined is one of development. The law which

regulates the numerical proportions of the two sexes, and of the different classes of ages, in regard to criminality, is a law of existence. On the other hand, if we examine into the law of mortality, that is, investigate the constant diminution of a generation of persons born, or of persons now at a given age, we have a law of development.

Laws of causation are those which assert that two distinct phenomena which have been statistically determined are related to one another as cause and effect. For instance, if there is a constant connection between the price of grain and the amount of crime, we have a statistical law of causation.

These two kinds of statistical laws occur, as we have already shown, both in the case of phenomena independent of the human will, and especially in the case of those actions which are arbitrarily determined. The study of the laws which govern these latter is of the highest general interest. Statistics have undoubtedly established here an entirely new basis for the proper comprehension of "free will."

Having now described the three stages of statistical inquiry, it remains only to examine the means of representing statistical results. If these were only numerals and language, no explanation would be required. But of late the graphic representation of statistical results has been making more and more way. This method is most advantageously employed in the popularisation of statistics, and on this account deserves a special consideration.

But it may be as well to deal briefly with numerals and language as means of representing statistical results. The original form of statistics is the numeral, which is absolutely essential, since without numerals there can be no statistics in the modern sense. The numerals, however, are not given in a confused mass, but in the form of well-arranged tables. These tables give the quantitative results of aggregate-observation completely and comprehensively grouped, with proper regard to the facts which form the basis of classification. The tabular form is looked upon with unreasonable dislike by the reading public. This is because the study of tables demands concentrated thought, while the public prefer thought diluted by phrases.

That the science of statistics cannot dispense with words is obvious. We only make special mention of language as a means of representation in statistics, because formerly, especially in official circles, the general opinion was that statistics ought to produce numerals and nothing else. At the present time there is scarcely anyone who seriously shares this narrow notion. When official statistical tables first began to be published, there was some

excuse for the notion that non-official cultivators of the science would seize on the newly won material with enthusiasm, and make use of it in many ways. The lapse of time has cured the official statist of this delusion, by showing him that statistics composed solely of numerals are only still-births. The statist who conducts the inquiry and undertakes the construction of the tables, is bound to use his numerals for the purposes of science, and to perform the work of criticising them himself. And this of course is impossible without verbal explanation. If the statist will not himself enter the sea of figures he has placed before the public, he cannot be surprised if the public, who are little acquainted with the depths and shallows of this ocean, are from the first frightened away from it, and pay no further attention to the columns of figures which are presented to them.

The method of Graphic Representation requires a fuller explanation than is required for numerals and words.

The graphic method includes both the simple geometrical representation of statistical figures, the Diagram, and the representation of statistical relations on maps, the Cartogram. These two classes of graphic representation are essentially different, and it is necessary therefore to deal with them separately.

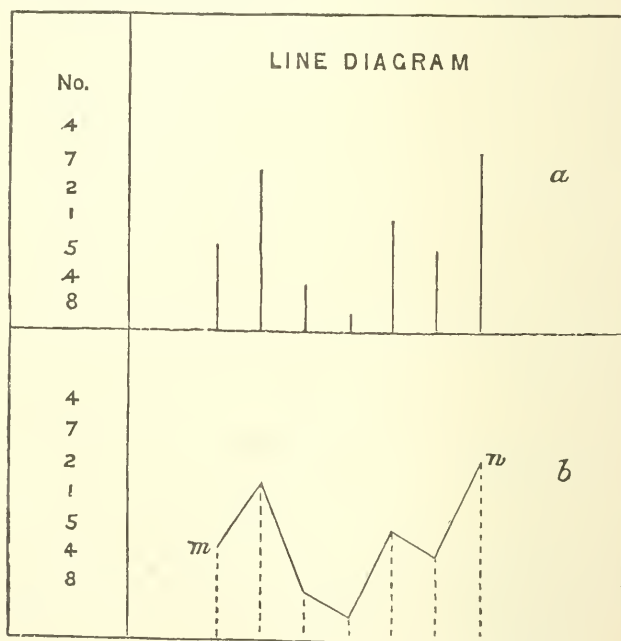


Fig. 1.

I. Diagrams.—The geometrical conceptions at the disposal of

statistics are the point, line, surface, and solid. Of these the point is obviously of no use in diagrams proper. But if we combine topographical representation with the diagram, that is, combine the cartogram with the diagram, the point obtains a significance, as will be subsequently shown.

(1.) *The Line.*—The line may be employed in diagrams in two ways; we may have, first, straight lines of different lengths; and, secondly, lines joining the terminal points of such lines. In such cases a regard for clearness makes us choose straight lines, and for the same reason we select parallel lines drawn at right angles to a fixed base.

The first of these (Fig. 1, *a*) is too wanting in clearness to be of much value, especially as the end in view can be much better attained by the use of surfaces placed in juxtaposition. Thus—

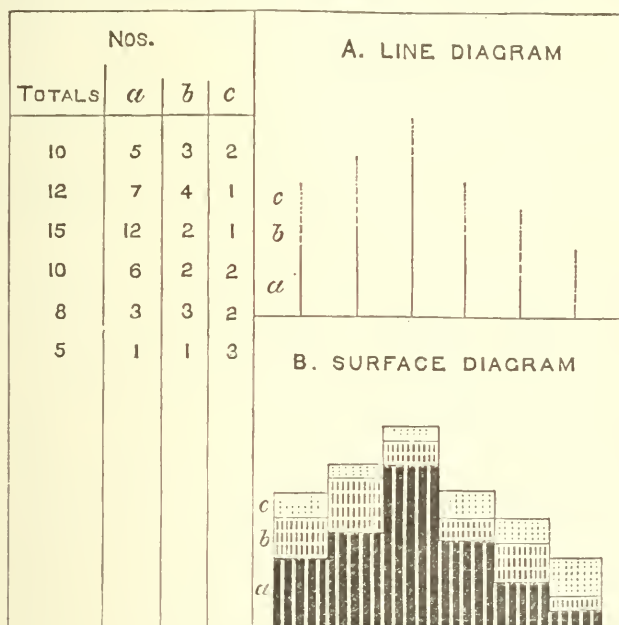
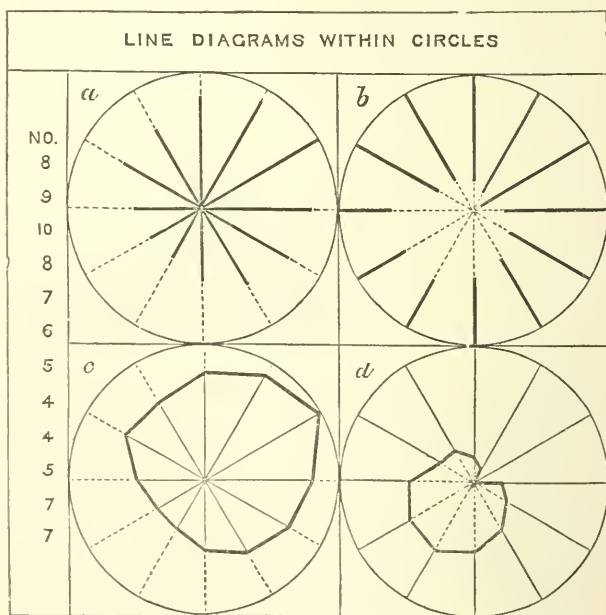


Fig. 2.

In this diagram, the breadth of the surfaces gives the eye rest, and it obtains the guidance which is desirable, from the series of steps produced by the juxtaposition of the different surfaces. The use of surfaces in juxtaposition is further advantageous, since by them we can show internal differences among the totals represented, much more easily and clearly. Lines cannot be so easily distinguished in their parts, by means of variations of colour and shading, as surfaces. This is obvious in a comparison of *A* and *B* (Fig. 2).

It therefore appears that the mere juxtaposition of straight lines of various lengths is not enough to form a line diagram. The other class of such diagrams, which are formed by joining the extremities of the various lines are more useful. Line diagrams of this kind, which are often, though not always correctly, called "curves," have been employed much and in various ways, and will always continue to be a valuable assistance in the graphic representation of statistics.

The advantage of this kind of line diagram is chiefly this: it affords the eye a simple and sure guide in following the rise and fall of numerical relations. In addition, it has the further advantage of taking up a minimum portion of the space devoted to graphic representation, and therefore enables us to place in the same linear system one or more comparison diagrams. We may, for instance, represent the mortality, birth-rate, price of grain, and changes of temperature, in one diagram, containing four lines for comparison among themselves. Comparative diagrams of this kind composed of lines which can be made easily distinguishable, by the use of colours, or dots, or breaks in their course, and similar devices, materially facilitate the investigation of parallelisms or antagonisms between different phenomena. They are therefore of interest not merely to the consumers of statistics, as mere illustrations of statistical figures, but also to their producers, by the aid they afford to comparative inquiry.



Line diagrams of the above kind are advantageously employed when it is our object to examine merely the members of a series of statistical figures, which do not change in their essential character, and which vary at stated intervals. For instance, they are well suited for the representation of the history of the prices of specified commodities, the yearly variation in the number of deaths, crimes, and so on.

For the purpose of representing facts which actually form a cycle, a line diagram based on a circle may sometimes be employed, for instance, when we desire to represent the death-rate of each month, not during a single year, but by means of the average of each month taken over a series of years. In this case, January is as near to December as to February, a fact which cannot be represented except by taking a circle as the basis of the diagrams. Portions of radii, measured either from the centre or from the circumference, form the lines whose length is made proportional to the numerals (Fig. 3).

(2.) Surfaces.—The point diagram is of hardly any use, and the line diagram is only available in certain circumstances. All other statistical relations which we desire to illustrate by diagrams, must be represented by surface diagrams, for the employment of solids is impracticable, in literature, at all events.

As previously observed, a great advantage of surface diagrams is, that they admit of a complete representation of the internal composition of the statistical quantities placed before us. But the representation of various details should not be carried too far, or a mistake will be made similar to that committed in a line diagram, where the lines to be compared are too numerous and intersect one another.

The conditions under which surface diagrams are suited to the purpose they are intended to serve, are the following:—

The figures chosen must be *simple*. For the representation of the composition of simple totals, the most suitable figure is the *square*, which can be divided into the proper number of rectangles.

If several statistical facts are to be united for comparison by means of a surface diagram, the most convenient figure is the rectangle. We may employ either rectangles with equal bases and varying altitudes, or rectangles with varying bases and the same altitude. The first of these is the more easily comprehended. It is closely allied in character to the line diagram, and can always be used to supplement the latter, when it is desirable to represent the internal grouping of the separate facts expressed by it. Such surface diagrams are much used. It very materially adds to the clearness of these diagrams, if the squares of the system

of cross lines in which the rectangles are drawn, are so arranged as to represent either unity, or some decimal part of it.

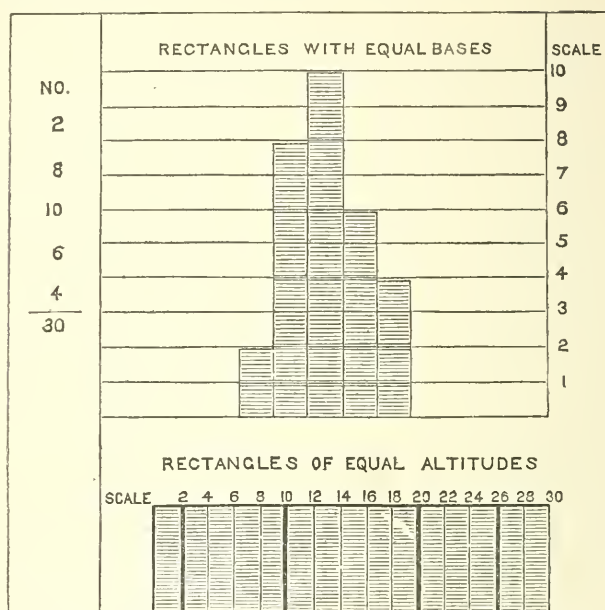


Fig. 4.

No other figures besides rectangles are suitable, except that in certain cases (although the employment of triangles in such a diagram as the above is useless) a single *triangle* may be advantageously employed to represent facts which are composed in special ways; for instance, when we desire to contrast a qualitatively important minority with a qualitatively inferior majority.

The triangle is the form especially suited for diagrams when the parts of a total to be represented form a qualitatively ascending series, as for instance the state of public instruction, beginning with the national schools and rising to the highest class of schools.

By dividing the triangle horizontally, as in Fig. 5, B, the level of the surfaces is progressively rising as they approach the vertex, and the statistical relations to be represented are well marked, without affecting the proportions between the parts. If it were attempted to show the same relations by means of a square, the qualitatively important but quantitatively insignificant minority would almost entirely disappear (*see* Fig. 5, A).

No other figures are practically suited to our purpose. It should be noticed, with regard to the use of surface-diagrams, that they admit of the most extensive application of colouring and

shading, as a means of distinguishing the separate diagrams and their different parts. In particular, a judicious use of colours and shading renders it possible to give expression to many facts in a single diagram. Care must, however, be taken that the diagram may not become artificial and hard to understand.

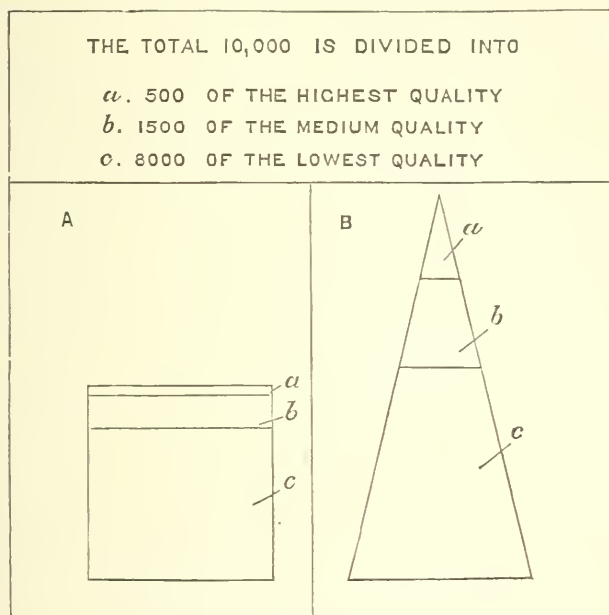


Fig. 5.

The employment of solids does not concern us for the purpose now in view.

II. Cartograms.—The cartogram is essentially different from the diagram in that it is not merely a means of making the numerical facts given in tables perceptible to the senses, but contains something else which the tables cannot represent. This new feature, which in the cartogram attaches itself to the numerical facts contained in the table, is the introduction of the topographical disposition of the statistical facts, which can never be grasped sufficiently by means of the table alone. The peculiarities of the cartogram therefore supply a real improvement, and not merely a secondary means of illustrating statistical results. The scientific value of cartograms is therefore much higher than that of diagrams.

Since we must include, under the head of cartograms in the wider sense, all forms of the topographical representation of statistical results, we have to consider the following kinds of cartogram.

1. Cartograms in which only points are employed to represent

special facts determined statistically (the point cartogram). This primitive form of cartogram has been long in use in maps, especially for the purpose of representing the statistical facts, in particular those of population, which are shown in maps together with the purely physical features of the country. We are, of course, not thinking here of points in a strict sense, but include all hieroglyphic or conventional signs used in map making, which denote special facts of a simple kind, without giving their quantitative relations. It is worth noting that in the traditional hieroglyphics of ordinary maps there are here and there traces of an attempt to form topographical diagrams. This is especially the case with the signs for populous places, great cities in particular, which in ordinary maps usually bear some relation, however rough, to the number of the inhabitants of the place.

2. Cartograms on which statistical facts are represented by *lines* (line cartograms), cannot easily be employed as a rule, for in all cases where our object is to represent the geographical distribution of statistical facts, surfaces are much preferable to lines.

3. Representation by means of surfaces is of great importance in statistical cartography. Surface cartograms are divided into three sub-classes: A.—Cartograms with surface diagrams in their proper geographical position. B.—Cartograms with bands showing the local movements of aggregates. C.—Cartograms in which statistical averages calculated for whole sections of a district are represented on a special plan of grouping, by means of colours or shading.

A. Cartograms with simple surface diagrams in their proper geographical position, are merely maps of the ordinary kind with statistical additions. The social facts which on ordinary maps only appear as supplementing the signs relating to the physical features of the country, without being represented quantitatively, are in this kind of cartogram clearly marked both in number and proportion.

Since all that is required in this case is to distribute the surface diagrams above described in their proper geographical positions, there is nothing special to say about the construction of this class of cartogram.

B. Cartograms with *bands*, showing the local movements of aggregates, are maps of means of communication illustrated statistically. For instance, while ordinary maps only show the *direction* of a railway line, a band-diagram gives in addition quantitative information regarding the passenger or goods traffic. The mode of representing these facts is simple, and its nature easily seen in Fig. 6.

At the starting point of the traffic a line of a convenient length is taken on which to represent the value or amount of the

aggregates moved; there should also be some means of distinguishing between the different kinds of traffic. Every increase or decrease of the quantity transported is to be represented at each station where it occurs by a line proportional to that first chosen. These lines should be, as far as possible, perpendicular to the main traffic line. Lastly, these single lines at the separate stations should be joined, thus producing a series of *bands*, each of the same breadth as the line drawn at the successive stations, and extending as far as the next line, which bands should be coloured or shaded.

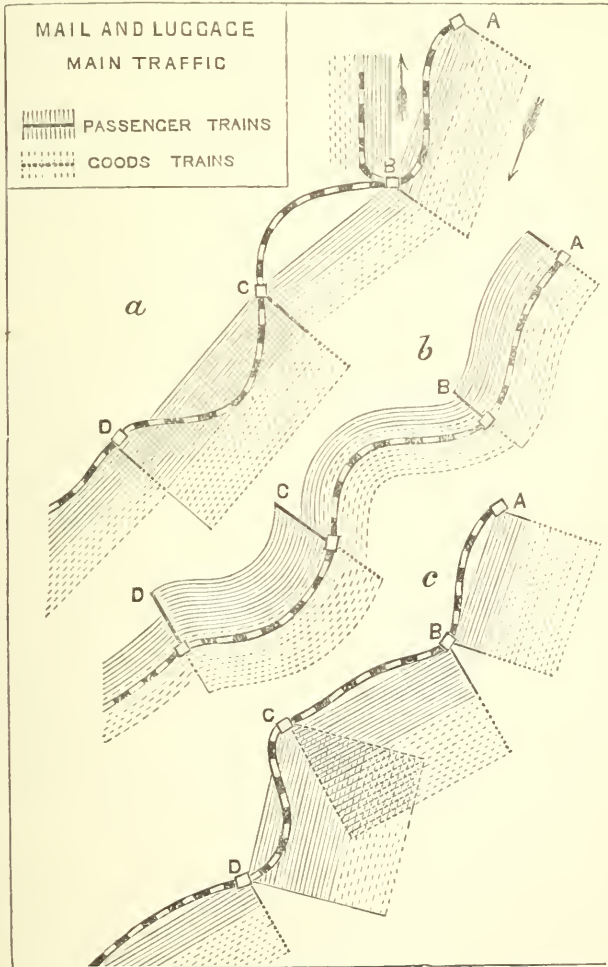


Fig. 6.

This surface-diagram is only mathematically correct when the traffic roads are straight. Where curves occur errors are intro-

duced, and the surfaces are no longer proportional to the produce of the quantity moved into the distance traversed. If the continuity of the bands is to be maintained, this defect cannot be avoided, whether, as in Fig. A, we choose to ignore the curves between the separate stations, or whether, as in Fig. B, we allow the bands to follow the course of the traffic route. If we break the continuity of the bands at the points where curves occur, and then construct rectangles on the lines belonging to each station, whose height is determined by its distance from the next station, the representation is then correct mathematically. But the breaking up of the continuity of the bands, and the overlapping which takes place in consequence, is rather confusing at first sight. Fig. 6, B, presents in any case the best appearance.

C. Cartograms in which statistical averages calculated for whole sections of a district are represented on a special plan of grouping, by means of colouring or shading, are statistical maps in the less wide sense. They are the most important aid to the geographical method above described, which attempts to obtain the actual grouping of certain facts in the large natural districts, on the basis of statistical averages determined for smaller districts.

Since in this case the basis of the graphic representation is formed by districts which are very various in their geographical character, and which especially differ from one another in form and area, it is evident that statistical facts can only be cartographically represented on this method by relative numbers. By this means the separate dissimilar areas obtain the similarity which is requisite for statistical comparisons. All other forms of diagrams and cartograms which we have thus far explained, are in theory as well suited to represent absolute as well as relative numbers.

If the cartograms here referred to are to be of any value, the sections of country which are being measured out with a view to the statistical facts in question, must be chosen, so as to be the *smallest possible*, with due regard to the law of large numbers. The question of grouping is also important. The grouping is most perfect when we take the difference of the general maximum and minimum, and divide this difference by the number of the groups which disclose themselves. From this we obtain the limits of each group in the scale.

It is also necessary in practice to consider how colouring and shading are to be employed in arranging the single districts in the groups selected. The use of shading alone is not sufficient, when any considerable number of groups is to be represented. In the case of four or five groups, the differences can be made easily obvious by means of shading; but when the number rises to eight or ten groups such delicate differences become requisite, that the

clearness of the picture is destroyed. And the same objection applies to the employment of a considerable number of colours. Whatever series of colours is chosen, as soon as the observer has to make use of a long scale of colour, the cartogram becomes difficult to comprehend. The best plan, therefore, is to combine colour and shading. Two colours may, for instance, be chosen, and then by the use of four or five kinds of shading we obtain the means of easily distinguishing eight or ten groups. As an example we may refer to Fig. 7,* which is a portion of a map of the infant mortality of South Germany for the year 1870, taken from the "*Zeitschrift*" of the Royal Statistical Bureau of Bavaria. Maps which are to be used as a basis for the application of this method must show the boundaries and names of each district with sufficient clearness. It is open to question whether they should contain further geographical indications, and if so to what extent. Excessive details speedily destroy the clearness of the shaded colours. On the other hand, the complete absence of geographical indications renders impossible the making of orographical and hydrographical comparisons, which are much to be desired on their own account. Hence the positions of the principal rivers and mountains should be added, always provided that the working out of these geographical signs in practice does not interfere to any extent with the clearness of the shaded colours which are to be superposed on them.

If we have, in the foregoing pages, treated at some length of the theory and construction of statistical diagrams, we are justified in so doing for the purposes of the present work, because cartographical representations are pre-eminently suited for making the results of statistics easily and generally understood.

The close relations which exist between statistics and the State have been already explained. A final remark as to how these relations have become patent to all, through the organisation and development of official statistics, will not be without interest for some of our readers.

The knowledge that the most important objects of statistics cannot be carried to their completion without the aid of State intervention was diffused tolerably soon, but the attempt to organize these official statistics was made much later, and is by no means concluded yet.

We may distinguish three periods in the development of official statistics, which, however, are not separated from one another in all respects with equal clearness.

In the *first* period, which includes the latter half of the pre-

* It has not been thought necessary to reproduce this diagram, which is in two colours, each of four shades.

ceding century and the earlier years of the present, the need for official statistical information began to make itself felt. The practical methods of collecting statistics were then quite simple. The specific localities concerning which information was to be given were decided on by the central Government of the State, but no trouble was taken with regard to the method of collection. The inferior political officials had charge of the process of observation and of the whole work of grouping the facts, and were originally left without the guidance of any fixed and uniform rules for the operation. In the rarest cases only do we meet with any further treatment of the information obtained, with a view to practical or scientific objects. Generally, the authorities were contented with mechanically adding up the totals received from each province to obtain that of the whole country. The publication of official statistical information was, as a rule, forbidden, and was only permitted under special safeguards. Statistical tables were part of the secrets of the State.

The *second* period may be considered to commence with the establishment of special statistical bureaux. The masses of statistical information which had been collected during the first period could no longer be dealt with by the central authorities, and in particular by the political administration. Tables were heaped on tables, and there was no one to inspire the rows of figures with life. Accordingly statistical bureaux were established. At first their domain was very contracted; very often they were expressly confined to the business sphere of a single administrative department. Moreover, they had no control whatever over the management of the process of collecting statistics. Generally speaking, the inferior officials were still left in charge not merely of the collection, but also of the statistical treatment of the observed facts. The statistical bureaux had, in fact, only to attend to the final concentration and revision of the materials which were already arranged in the tabular form by subordinate officials, and at the same time to superintend their publication. How far this work of publication was combined with a further practical and scientific appreciation of the results obtained, would depend entirely on the personal character of the directors of the official statistical bureaux.

In general, the field of operations of statistical bureaux during the second period was not very extensive; but in it may be discerned the germ of the development which occurred during the third and most recent period in the history of official statistics.

This development is not merely a movement of extension, by which new regions, hitherto not subjected to aggregate-observation, are included in statistics, but it is above all an internal change, which expresses itself in the continual improvement in the technical

part of statistics. Now, for the first time, we find effected that careful separation, described minutely above, between the collection of statistical facts on the one side, and the treatment of the material thus obtained on the other. Now that this latter operation is performed in special statistical workshops, viz., the statistical bureaux, it has been carried to a pitch of perfection hitherto unknown. The art of statistical combination, has especially shown a flourishing growth in its improved modes of constructing and employing complicated tabular work.

At the same time there is an evident tendency to allow official statistics to step beyond the peculiar domain reserved to bureaucracy. Attempts are made to induce the public to lend their active co-operation in the most important statistical inquiries, especially in the case of a census. It is not considered enough to leave the filling up of the numeration papers to the heads of families alone, but volunteers are sought for to whom is entrusted the honorary office of a numerator.

In order to reduce the process of collecting statistics in each country to uniformity, so-called central statistical commissions were established almost everywhere, in accordance with the example of Belgium. They were composed of delegates from the various centres of administration, especially the various ministers of State, as well as of the heads of the statistical bureaux, and of men of science specially invited to assist.

Simultaneously an attempt was being made by means of international statistical congresses to render comparable the statistics collected in the various countries of the civilized world. Although this end has, as yet, not been completely obtained in all respects, yet the advance that has been made in statistical science by means of these congresses is very remarkable. The first took place in 1853 in Brussels, at the suggestion of the veteran Quetelet. Since then international congresses of statistics have assembled in Paris (1855), Vienna (1857), London (1860), Berlin (1863), Florence (1867), The Hague (1869), St. Petersburg (1872), and Budapesth (1876). One remarkable feature of these congresses is the co-operation of consumers with the producers of statistics. The "producers" are the official statistical delegates sent to these congresses by the different Governments. The men of science take part in the congress in concert with the officials, being interested as "consumers" in the labours of the latter. Under the pressure exercised by the "consumers," who as a rule are very numerously represented at the congresses, the resolutions of these assemblies are often marked by a profusion of demands on the official statistical establishments, which extends beyond the limits of the attainable. This circumstance was one of the causes which led to

the establishment, at the congress of St. Petersburg, of a permanent commission of international statistical congresses, composed exclusively of "producers." To this commission is entrusted the management of comparative international statistics, and of the revision of resolutions of the congresses, which is for this purpose highly desirable. It has already met in Vienna (1873), in Stockholm (1874), in Buda-Pesth (1876), and in Rome (1877).

As another special sign of the high degree of interest that has recently been aroused by official statistics, it is especially worth noting, that the great cities are more and more feeling the need of establishing special bureaux of municipal statistics.

MISCELLANEA.

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I.—ENGLISH EXPRESS TRAINS : *their* AVERAGE SPEED, &c., with
NOTES on GRADIENTS, LONG RUNS, &c.

By E. FOXWELL, ESQ.

Definition of “Express.”

THE object of this paper is to give an account of the Express trains run in England. We must therefore first decide by what test we speak of a train as “express.”

The words “*journey-speed*” will be used to denote the average number of miles per hour, *stoppages included*, by which a train advances on its journey: *e.g.*, the Great Northern “Scotchman” reaches Edinburgh nine hours after leaving King’s Cross, a distance of $392\frac{1}{2}$ miles; its *journey-speed* is therefore $43\frac{3}{5}$ miles per hour, or, shortly, “j.s. = $43\frac{3}{5}$.”

Now on examining the various passenger trains in England, we shall find that though there are individual trains with “journey-speeds” of every gradation from 15 to nearly 50 miles an hour, yet these arrange themselves naturally in three thickest clusters :—

Miles per hour.		
Trains with a <i>journey-speed</i> of about	15—25	{ “ <i>Stopping</i> ” trains } Stop every, or nearly every station
	30—35	{ “ <i>Fast</i> ” ditto } Irregular in method, sometimes several stops, then a long run, &c.
	40 (39) and upwards }	Long spells of running; no lounging at stations

that is to say, trains with journey-speeds *between* 25 and 30, or between 35 and 40, are a thin percentage of those with journey speeds of 15 to 25, 30 to 35, or 40 and upwards.

Secondly, if we look at all those trains which the Companies themselves designate as “express,” we see that seven-eighths of the aggregate have journey-speeds of “about 40 and upwards;” some small Companies it is true call trains “express” (the Brighton is a great offender) whose journey-speed—on ordinary gradients—is as low as 37, but these are not the ones to ask for a definition, and the total number of such trains is relatively insignificant;

others again (the Great Western, Great Eastern, and North Eastern) exhibit a few mongrel specimens which try to be both "stopping" and "express;" but the vigorous northern companies have sharp lines of demarcation.

Thirdly, the public mean "express" to mark distinction. But those who are familiar with English railways will admit that a train running over an average sample of our gradients and in ordinary circumstances, does not deserve distinction unless its journey-speed is up to 40.* Now and then, where circumstances are exceptional,—crossing the Pennine or over the Lowlands—we find a train with journey-speed as low as 37 or 36, and yet it must be called "express," because it keeps on and does all that can be done; in fact these runs are often the most admirable.

If then we draw the line of our definition where the trains themselves leave us most room, where the best Companies agree with us, and where it falls in with the general understanding, we see that an "express" is a train whose "journey-speed," under ordinary conditions, comes up to 40 miles an hour.

This is the strict definition; but as on some lines (North Western, *e.g.*) where gradients are only ordinary, certain good trains do occur with a journey-speed about 39, we relax this much, and admit such trains under protest—an act of grace not often demanded.

Thus the trains collected and averaged in this paper will be either—

- | | | |
|-------------------|---|---|
| "Express" trains, | { | (a.) The general rule; those which run under ordinary conditions, and attain a journey-speed of 40 and upwards. These are about 85 per cent. of the whole. |
| | | (b.) Equally good trains, which, running against <i>exceptional difficulties</i> , only attain perhaps a journey-speed as low as 36 or 37. These are about 5 per cent. of the whole. |
| | | (c.) Trains which should come under (a), but which, through unusually long stoppages or similar causes, only reach a journey-speed of 39. These are about 10 per cent.† of the whole. |

No trains coming intermediate to (b) and (c) will be admitted, and those of the (c) class will be justified as they occur. If it be asked why trains—running under ordinary conditions—with a journey-speed of 37—39 are not admitted, the answer is that there are so few of them in comparison, and that the definition is made accordingly; having made it, we must stick to it for the sake of order. A train, *e.g.*, whose journey-speed = $38\frac{1}{2}$ will simply be

* This only happens to be the standard just now; in ten years the majority of trains will probably have levelled up to a mile or two more.

† 10 per cent. of the *number*, but not of the *mileage*, of the whole; for most of this class run short journeys.

mentioned alongside the expresses. But all the trains *averaged* have a journey-speed as high as 39, except the small percentage which form class (b).

“*Running-average*” (r.a.).

The term “running-average” must here be explained. By this is meant the *average speed* per hour while actually in motion *from platform to platform, i.e.*, the average speed obtained by deducting stoppages. Thus, the 9-hour (up) Great Northern “Scotchman” stops 49 minutes on its journey from Edinburgh to King’s Cross, and occupies 8 hours 11 minutes in actual motion: its “running-average” is therefore 48 miles an hour, or, briefly, “r.a. = 48.” The tabular statement for this train will thus appear:—

Distance in Miles.	Between.	Time.	Journey-Speed	Minutes Stopped.	Running-Average.
392½	Edinburgh and King’s Cross	H. M. 9 0	43½	49	48

[*Digression.*—It must be noted that the “r.a.” of a train will generally seem too low to those who have travelled by it. This is partly because in the “average” is included the slow speed at starting and stopping, as well as any checks due to cautious running through suburbs (this affects the *Great Eastern* and *Brighton* lines in particular) and junctions, or round sharp curves, over certain bridges and viaducts, &c. But the disappointment is chiefly owing to the fact that few people notice the *diminution of speed* in *running up gradients* (it requires practice to be much affected by the difference between 50 or 35 miles an hour), while the brilliant, though in consequence short, dashes down so impress the imagination (especially as we often finish with this, large towns being on low levels) that the journey seems to have been mainly composed of them. The average impression made on our consciousness is, in fact, much higher than would be made by the *uniform* continuance of a speed equal to the *average* of the different speeds at which we have been running;* thus the calculated “r.a.” comes out a disappointment. This is strikingly shown in the case of the running between Carlisle and Hawick by the North British. Here, when we have once got up the long ascent

* It is for this reason that the Great Western “Dutchman” deceives its passengers in a converse way. Between Paddington and Swindon, on a very smooth line free from gradients, the 55 miles from Taplow to Swindon are run within the hour, but as the speed is so uniform it attracts less attention, and most people are surprised if they consult their watches.

of $\frac{1}{75}$ after Newcastleton, and, having passed the tunnel at the top, proceed to sweep down the descent at a pace that seems fabulous, the impression of speed remaining with us at the finish (repeated later when we drop on Edinburgh from the Fala Moors), is so intense that we are incredulous of the fact that the *running-average* has been only 42.

This is because we forget that in making an ascent away from the earth's centre, followed by a corresponding descent nearer it, we spend more minutes altogether than would have been required for running, with an equal expenditure of work, the same number of miles on a level. For suppose that an engine, which, working as hard as it can, makes 60 miles an hour on level, comes to an ascent. Suppose that while ascending, the earth annuls, and while descending the other side contributes, one-third of the speed on a level, *i.e.*, the engine goes up at one-third less, and comes down at one-third more, than 60 miles an hour. Going up at a speed one-third less, each mile must take one and a half times the number of minutes it would on level; while coming down at a speed one-third greater, each mile is done in three-quarters of the number of minutes it would take on a level. Half a minute is lost on each mile going up, and only one quarter of a minute saved on each going down: that is, compared with the same engine on level ground, one quarter of a minute extra is required for each mile of the whole distance. Thus, spending more minutes than if the same distance were level, our *running-average* falls, for "running-average" is the average space passed through each minute.

Or, again, it is obvious we go up hill slower than down, that a 10-mile ascent consumes *more minutes* than the 10-mile descent. And, therefore, *even assuming* that the extra speed added down hill is as great as that subtracted up, which cannot be in practice (see p. 560), still, as it produces its compensatory effect *during fewer minutes*, it cannot recover what was lost to an equal degree during each one of *more minutes*. During every minute of the ascent we are dropping behind our imaginary rival on the level; while during every minute of the descent we only gain on him in the same degree,—and there are fewer minutes in the descent. So the train on the level must, with an equal expenditure of work, beat us. Gradients exemplify the motto, "Heads I win, tails you lose;" but as the loss ends up so brilliantly (the station will be at the *bottom*), and the period during which the gradient was winning is several miles away, we are liable to miss the fact.

And thus there is nothing paradoxical in saying that, over English gradients on a fair sample of a line (not on an easy bit like the North Western from Liverpool to London), we need not be surprised to experience a few miles at 60 *miles an hour*, even

though the "r.a." be no higher than 44 or 45. The "Dutchman" and the Scotch express over the North Eastern ought to maintain (as they do) a uniform high pace; but, as a rule, the log of our fast trains consists of long (measured by time) pulls up hill at 30—40 miles an hour, shorter spins of 50—55 on the level, and still shorter dashes down hill at 60 to 70 miles an hour; and a "running-average" of 45 in England is generally a very smart performance. Abroad such things never occur, except once or twice in the United States.

The "r.a." is the skeleton that gives us the outline of the speed; but this must be clothed in each case with the details of local knowledge concerning hills, junctions, stations, tunnels, &c., if we wish a real flesh-and-blood picture of what takes place in practice.]

Proceeding now with the definition given, *i.e.*, admitting no trains with a journey-speed less than 39 unless they can plead exceptional difficulty of route, we shall examine each* Company in turn, and see—

1. The number of distinct "*express*" trains run by it, and the average of their—
 - (a.) Times on journey.
 - (b.) Journey-speeds.
 - (c.) Minutes stopped on way.
 - (d.) "Running-averages."
2. The resulting *express service* between London† and the chief towns on the Company's route, *i.e.*, the number of journeys to and from London per day at express speed. Also the averages for these journeys.
3. The *Long Runs* made daily, *i.e.*, runs of at least 40 miles in length, and done at a running-average of at least 40. Their averages. Also the *longest* and *quickest* of these.
4. The *express mileage*, *i.e.*, the total number of miles run by trains whose journey-speed satisfies the definition of "*express*."
5. The log of its *best express*.
6. The *gradients* over which this running is done.

And we conclude with tables of the summary under each head,

* The *Lancashire* and *Yorkshire* is the only great Company with no expresses. This is partly owing to the geographical situation of its towns, which hug the sides of the Pennine. In *Ireland* there are none.

† As a rule the number of *expresses* between any two towns is synonymous with the number of London expresses whose route lies through the towns. Except between Liverpool and Manchester, and between several places on the south-western fork of the Midland, there are in general no independent *local* express trains. But there are scores of "*fast*."

giving also the time of the quickest express between London and each of the most important towns in England.

Before beginning, a few words as to the reasons for which our expresses are run. The North of England, which created high speed, is still the chief occasion of fast trains. Lancashire and Yorkshire are responsible for the majority of our best expresses; and these are better than they might be because of London being at an extremity of the island. It is often an object with business men to go there and back, with time for action there, within the limits of a day. Hence, as the stirring towns in England are so far north, high speed becomes for them a necessary of life, and then a commonplace for all.

The distribution of our chief expresses (over the main routes) may be roughly stated:—

Between	Number of Distinct Expresses.	Com- panies.	Run by
Liverpool and Manchester there are	52	2	M.S. & L. and N.W.
" " and } "	48	4 {	N.W., Mid., G.N.,
Yorkshire towns and London *	26	3	G.W.R.
" themselves....	12	1	G.N., Mid., G.E.
Lane. and Yorks. and Scotland	7	2	N.E.
" S.W. of } "	12	1	Mid. and N.W.
England † }			Mid.
Leeds and Derby, local	4	1	Mid.
L'pool and Buxton (business) ..	2	1	Mid.
Scotland and London (through) ..	23	3	G.N., Mid., N.W.
Birmingham and London.....	9	2	N.W. and G.W.
{ Cambridge itself and London ..	7	1	G.N.
{ " Norwich and London ‡	11	1	G.E.
{ Colchester, &c., and London ‡	6	1	G.E.
{ Ipswich, &c., and London ‡	8	1	G.E.
{ Sussex seashores and London }	14	1 {	L.B. & S.C. [S.E. runs
{ (business men)			one, St. Leonard's]
{ Kent seashores and London	4	2	L.C.D. and S.E.
London and ports for Continent..	18	3 {	L.C. & D., S.E., and
" Exeter (for S.W.)..	7	2	G.E.
" Bristol itself	6	1	G.W. and L. & S.W.
Ireland and London	4	1	G.W.
Glasgow and Edinburgh them- selves	16	2	N.W.
Crewe or Rugby and Euston §	15	—	Cal. and N.B.
	311	—	N.W.

* Not counting through *Scotch* trains.

† Liverpool and Derby, 4; Hull and Milford, 4; York and Bristol, 4.

‡ Most of these are on account of Norwich or Yarmouth, but are not *express* the whole distance.

§ These are meant for expresses to Liverpool, Manchester, or Birmingham, but are not fast enough *all the way* to be entered in these tables.

The companies that run "express" are 14 in number, and they arrange themselves thus:—

Four south of the Thames: South Western, Brighton, South Eastern, and Chatham and Dover.

The Great Western } both unlike other lines.
The Great Eastern }

The three great routes northwards: the Great Northern, Midland, and North Western.

The two English and three Scotch which help work the northern traffic: Manchester, Sheffield and Lincolnshire, North Eastern, Caledonian, North British, and Glasgow & South Western.

We shall begin at the bottom of England and work upwards; and, speaking generally, as we go north we find better performances, the acme of excellence being reached in the transverse strip of England lying between the latitudes of Sheffield and Leeds.

We take the census of all† the "express" trains running in England during the summer season of 1883, *i.e.*, those given in "*Bradshaw*" for August, 1883. In winter there is a falling off on some lines, chiefly those running to Scotland, or those serving fashionable seashores; but the fastest trains do not alter for the winter weather. There is altogether about 12 per cent. less express mileage run during winter than in summer.

LONDON AND SOUTH WESTERN.

Distinct Expresses.

Miles.	Between.	Number.*	Average Time.	Journey-Speed.	Average Minutes Stopped.	Running-Average.
171½	Waterloo and Exeter	3 (1 up)	H. M. + 10	41½	18	44½
		[Also 4 Fast	+ 35	37½	27	41½]

* *Up and down* reckoned separately; when the numbers each way are the same, the joint figure is simply stated; when more one way than the other, it is stated in a bracket.

† The 8.0 p.m. from King's Cross and 7.30 p.m. from Euston are not counted, as they are only "grouse" trains, which run about a month.

Note.—The working tables of the companies are the authority for correct *times* and *distances*. "*Bradshaw*" is wonderfully accurate for such a mass of details, but occasionally little errors (especially of distance) persist in type unnoticed.

These three Exeter expresses are the only ones run by the South Western. There is not one to either *Portsmouth*, *Southampton*, *Bournemouth*, or *Weymouth*. The quickest to those places are :—

Miles.			Time.	Journey-Speed.	
			H. M.		
73½	{ Portsmouth, } (up)		1 55	38½	(8 average about 2'18 = 32½ journey-speed)
79	{ Southampton ... } (down)		2 4*	38¼	(10 average about 2'21 = 33½ journey-speed)
115½	{ Bournemouth .. } (down)		3 9	36¾	
145½	{ Weymouth } (down)		4 0	36½	

* In the year 1848 the quickest ran in 1 hour 50 minutes.

Express Service to Chief Towns (provided by Express and Fast Trains together).

Miles.	Between London and	Number.	Average			
			Time.	Journey-Speed.	Minutes Stopped.	Running-average.
			H. M.			
171½	Exeter	3 (1 up)	4 10	41½	18	44½
83½	Salisbury	4 (1 up)	2 3	40¾	7	43
47¾	Basingstoke	13 (6 up)	1 8½	41½	2	43

Long runs (by express and fast) :—

There are 13, averaging 47½ miles, at 44½ running-average. *Longest* and *quickest* is from Yeovil Junction to Exeter (ticket platform), 48½ miles, in 63 minutes = 46½ running-average. (By three down trains)

3	Exeter and Yeovil
4	Waterloo and Basingstoke
6	Basingstoke and Vauxhall
—	—
13	—
—	—

Express Mileage.—Reckoning the three expresses and the *Long runs* of the fast trains: 890 miles, with a running-average of 44.

Gradients.—The London and South Western Railway is almost level to Basingstoke, and gets steeper as it goes west, having 10 miles steeper than $\frac{1}{200}$ between Basingstoke and Salisbury, 19 miles between Salisbury and Yeovil (nine are $\frac{1}{100}$ or worse), and 35 miles between Yeovil and Exeter (eighteen of which are $\frac{1}{100}$ or worse). From Basingstoke to Southampton is one gentle ascent and descent. The “direct” route between Woking and Portsmouth is very steep (*Haslemere*, the summit, 460 feet), as out of 48 miles 26 are steeper than $\frac{1}{200}$, 10 of them being $\frac{1}{80}$.

Best Express.

Miles.	Stations.	Time.		Speed between Stations.
—	Waterloo .....dep.	H.	M.	
		2	30	} 45½*
47¾	Basingstoke .....arr.	3	33	
		3	36	} 46¼
66¼	Andover Junction .....dep.	4	0	
		4	2	} 43
83½	Salisbury .....dep.	4	26	
		4	32	} 45
118	Sherborne .....dep.	5	18	
		5	19	} 46½
122¾	Yeovil Junction .....dep.	5	26	
		5	28	} 46½
171¼	Exeter { Ticket platform .....dep.	6	31	
	{ Queen-street .....dep.	6	32	
171½		6	33	

Journey-speed = 42½.

Running-average = 45.

* The other *down* express is similar to this, but the *up* takes 4 hours 24 minutes, stopping 24 minutes.

LONDON, BRIGHTON, AND SOUTH COAST.

This line has no chance of doing great things with such a short course, but it may be called a smart line for speed, if we consider the large proportion of suburbs in most of the long runs.

Distinct Expresses.

Miles	Between	Number.	Average			
			Time.	Journey-Speed.	Minutes Stopped	Running-Average.
			H. M.			
50½	Lond. Bridge and Brighton	4	1 10	43½	¼	43¾
50¼	Victoria and Brighton	4	1 16	40	2	41
50	London Bridge and Lewes.	1 (down)	1 15	40	2	41
50¼	Victoria and Lewes	1 „	1 16	39¾	—	39¾
65½	London Bridge and Eastbourne	3 (2 up)	1 38	40	2	41
		13	averaging	41*	and	41¾*
There are also these <i>Fast Trains</i> .						
—	London and Brighton	8 (2 up)	1 22	37	4	39
—	„ Lewes, &c. ...	7 (4 „)	1 22	36¾	3	38
60	„ Worthing	1 up	1 35	38	5	40
		16	averaging	37	and	38¾
<i>Express Service between London and Chief Towns.</i>						
50½	Brighton	8	1 13	41¾	1	42
50¼	Lewes	4 (down)	1 15	40	1	40¾
65½	Eastbourne	3 (2 up)	1 38	40	2	41

* In taking these averages for the journey-speed, each journey counts as a unit, whether long or short, but for the running-average every mile counts.

Long Runs.—There are 23, averaging 45½ miles, at 42 running-average (43½ beyond Croydon). *Longest*, between Eastbourne and Croydon, 55½ miles in 1 hour 17 minutes=43¼ running-average. *Quickest*, between London Bridge and Brighton, 50½ miles in 1 hour 5 minutes=46¾ running-average (5 p.m. down).

Express Mileage.

13 express trains, running..	700	miles at	41¾	running-average.
11 other Long runs, making	455	„	41¼	„
Total	1,155	„	41½	„

Gradients.—Of the four southern lines the Brighton has the easiest track. The only steep bit is from New Cross to Forest Hill=2½ miles of 1/100. There are three other ascents and descents, on each side of the Merstham, Balcombe, and Clayton tunnels, all

of $\frac{1}{264}$, each rise and each fall measuring respectively 8, 5, and $4\frac{1}{2}$ miles. The remaining 13 miles are nearly level.

Best Express.

London Bridge 5 0 } $46\frac{3}{4}$ running-average (this is about 48 running-
 50 $\frac{1}{2}$ Brighton 6 5 } average *beyond Croydon*).

SOUTH EASTERN.

Distinct Expresses.

Miles.	Between	Number.	Average			
			Time.	Journey-Speed.	Minutes Stopped.	Running-Average.
			H. M.			
74 $\frac{1}{2}$	Cannon St. & Dover (Town)	7 (1 up)	1 45	42 $\frac{3}{4}$	$\frac{1}{2}$	42 $\frac{3}{4}$
69	„ Folkestone „	2 (tidal)	1 45	39 $\frac{1}{2}$	—	39 $\frac{1}{2}$
83 $\frac{3}{4}$	London Bridge & Ramsgate	2	2 9	39	6	40 $\frac{5}{8}$
59	St. Leonards & Lond. Bridge	1 (up)	1 32	38 $\frac{1}{2}$ *	2	39 $\frac{1}{3}$
	Total	12	averaging	41 $\frac{1}{8}$	and	41 $\frac{3}{4}$

* Admitted because of gradients. See below.

Express Service to chief towns is represented above.

Long Runs.—There are 12, averaging 66 $\frac{1}{4}$ miles, at 42 $\frac{1}{3}$ running-average. The *longest* and *quickest* is between Cannon Street and Dover, 74 $\frac{1}{2}$ miles, in 1 hour 39 minutes = 45 running-average.

4 Dover and Cannon Street	1 Staplehurst and Cannon Street
2 Shorncliffe and Cannon Street	2 Folkestone „
2 Canterbury and New Cross	—
1 Ashford and London Bridge	12

Express Mileage.

12 expresses, running	885 miles at	41 $\frac{3}{4}$ running-average
1 Long run besides	54 „	41 $\frac{1}{2}$ (Ashford to London Bridge)
Total	940 „	41 $\frac{3}{4}$ running-average

Gradients.—The South Eastern has steep gradients, except between Tunbridge Junction and Ashford, where the line runs

nearly at sea level and quite straight for 20 miles. From New Cross to the Halstead summit there is a 12-mile pull, mostly $\frac{1}{120}$ or $\frac{1}{140}$, and a 6-mile drop averaging $\frac{1}{130}$ from Sevenoaks tunnel to Tunbridge Junction. Beyond Ashford is a long easy descent of 11 miles, past Shorncliffe and Folkestone, to Dover. On the branch from Tunbridge Junction to Hastings there are continual severe ascents and descents, half the distance being $\frac{1}{132}$ or steeper ($\frac{1}{53}$ short bit); of the entire run from London to Hastings one-half averages about $\frac{1}{130}$.

Best Express.

Miles.		Time.		Speed between Stations.
		H.	M.	
—	Cannon Street..... dep.	7	48*	45
74½	Dover arr.	9	27	

* When the times given differ from those in "*Bradshaw*," they are taken from the official working tables of the various companies.

LONDON, CHATHAM, AND DOVER.

Distinct Expresses.

Miles.	Between	Number.	Average			
			Time.	Journey-Speed.	Minutes Stopped	Running-Average
			H. M.			
78	Victoria and Dover	7 (4 up)	1 52	41 $\frac{3}{4}$	3	43
72	„ Westgate-on-Sea	2	1 41	42 $\frac{3}{4}$	2	43 $\frac{2}{3}$
	Total	9	averaging	42	and	43 $\frac{1}{8}$
<i>Express Service between London and Chief Towns.</i>						
79	Ramsgate	2	2 —	39 $\frac{1}{2}$	8	42 $\frac{1}{3}$
78	Dover.....	7 (4 up)	1 52	41 $\frac{3}{4}$	3	43
73 $\frac{3}{4}$	Margate	2	1 45	42	4	43 $\frac{4}{5}$
61 $\frac{3}{4}$	Canterbury	4	1 28	42	2 $\frac{1}{2}$	43 $\frac{3}{5}$
34	Chatham	3 (1 up)	— 51	40	2	41 $\frac{2}{3}$

Long Runs.—There are 8, averaging 63 miles, at 45 running-average. The *Longest* is Dover to Victoria, 78 miles, in 1 hour 45 minutes = $44\frac{3}{5}$ running-average. *Quickest* is Herne Hill to Dover, 74 miles, in 1 hour 36 minutes = $46\frac{1}{4}$ running-average.

1 Dover to Victoria	3 Herne Hill to Canterbury
1 Herne Hill to Dover	1 Dover to Chatham
2 „ Westgate	8

Express Mileage.—Nine expresses, running 690 miles at $43\frac{1}{2}$ running-average ($44\frac{1}{2}$ outside Herne Hill).

Gradients.—The Chatham and Dover is the steepest average of any of the main lines of the four Southern companies. Of the 78 miles from Victoria to Dover, nearly 50 are between $\frac{1}{100}$ and $\frac{1}{132}$, and only 18 easier than $\frac{1}{200}$. The line begins with a 27-mile ascent, broken by four minor descents, to Sole Street (300 feet), then dips up and down in short breaks to Canterbury, from which it rises 9 miles to Shepherd's Well (290 feet) and drops 7 miles into Dover. The gradients, though so incessant and steep, are not sufficiently long at a time to lower the speed much. The running-average of the best trains is however very creditable.

Best Express.

Miles.		Time.		Speed between
		H.	M.	
—	Victoria .....dep.	7	40	} $46\frac{1}{4}$
4	Herne Hill .....arr. dep.	7	47 49	
78	Dover (Town)	9	25	

Journey-speed = $44\frac{3}{5}$

Running-average = $45\frac{1}{2}$

Summary of the Four Southern Companies.

	Expresses.	Long Runs.		Total Express Mileage.	Running-Average.
			Miles		
Lond. and South Western...	3	13 averaging	$47\frac{1}{2}$	890	at $44\frac{1}{2}$
Brighton	13	23 „	$45\frac{1}{2}$	1,155	„ $41\frac{1}{2}$
South Eastern	12	12 „	$66\frac{1}{4}$	940	„ $41\frac{3}{4}$
Chatham and Dover	9	8 „	63	690	„ $43\frac{1}{8}$
Total	37	56 „	$52\frac{5}{8}$	3,675	„ $42\frac{1}{2}$

These four lines are, from an English point of view, very sparing of express trains, yet the above total shows an amount of speed of high quality greater than the joint contributions of the entire continent of Europe. In fact, the running-average of the best express in France, that from Paris to Marseilles, is only $39\frac{3}{4}$ (see p. 550), though it runs unusually long breaks at a time.

In proportion to the respective lengths of their systems, the results given above are best for the Chatham and Dover, worst for the *South Western*. This latter line is strangely destitute of expresses, as Southampton has found to its cost. Portsmouth, besides being a place of unique importance, is the only town in England with a population of 100,000 and not one train at 40 miles an hour.

The *Brighton* is the most brisk of the four Companies, but the presence of enormous fares in its express programme and the absence of third class (often second) passengers from it, cut away all ground for praise. The four trains that are lighted by electricity are "limited" to first class passengers, who pay 3*d.* a mile *plus* the Pullman charge, and yet in return for so much money there is little speed, as the running-average of the four is only $40\frac{1}{2}$! The one great merit of this Company is its enterprise in the matter of sound continuous brakes. It was the first in England to introduce an effective one, and all its trains are now fitted with the Westinghouse.

The best point about the *South Eastern* is its service to Paris, *via* Folkestone. This journey of 258 miles is at present done in 8 hours 20 minutes, a journey-speed of 31 miles an hour, land and sea and all delays included. The fine steel steamers used go faster than some of the Company's trains on land. The great blots on the South Eastern are its unpunctuality, its fares, its third class carriages, and the way in which *local* interests are sacrificed to continental traffic. Behind the nine continental expresses stands out a background of the dreariest, slowest trains in England. This is a specimen of a line eager to "tap" traffic, but not to encourage it.

The little *Chatham and Dover* is to be praised for the spirited way in which it runs over its hilly route. But during a great part of the year it is wasting its substance on the seven Dover expresses, while duplicates of these are running at identical times on the neighbouring South Eastern. These 14 Dover expresses merely divide, and do not breed, any continental traffic; for none of them are third class, and the fares are excessive.

Speaking generally, the four Southern lines do not take kindly to expresses, but seem to run them under protest, as compared with the spontaneous speed of the North of England. Then there

is a worse feature peculiar to these four companies, that is, their enormous fares. The utility of an express depends not more on its speed than on the low price at which we can avail ourselves of it. But, with the exception of the three Exeter and four Rams-gate trains, all the expresses of the Southern lines close their doors to third class passengers. Thus their service to the public becomes attenuated to a shadow of what it might be. Not content with this exclusion, they proceed to charge those whom they do carry fares which are phenomenal. We subjoin a few instances of the price charged for carrying people similar distances *by express* in the case of Northern and Southern companies respectively:—

Miles.	Between	Fares (single).			Daily Service. Counting Up and Down separately.
		1st Class	2nd Class.	3rd Class.	
50½	London and Brighton (L.B. and S.C.)	12 3	8 6	(none)	8 expresses, with a r.a. of 42
49¾	„ Bedford (Midland).....	6 7	—	3 11½	17 „ „ 45½
47¼	Edinburgh and Glasgow (N.B.)	6 6	5/-	2 6	
78	Victoria and Dover (L.C. and D.) ...	20/-	15/-	(none)	7 „ „ 43
75½	Charing Cross and Dover (S.E.R.)....	20/-	15/-	(none)	7 „ „ 42½
76¼	King's Cross and Peterboro' (G.N.R.)	11 3	8 9	6 4	29 „ „ 48½
83¼	Waterloo and Salisbury (L.S.W.)	17 6	12 3	6 11½	4 „ „ 43
82¾ & 84¾	Euston and Rugby (L.N.W.).....	12 9	9 10	7 2	50 „ „ 44½
73½	Waterloo and Portsmouth (L.S.W.)	15/-	10 6	(none)	No express at all
73½	Carlisle and Carstairs (Cal.)	12 4	9 3	6 1½	9 expresses, averaging 43 r.a.

Note.—In this last case, the gradients on both lines are very steep, but on the Portsmouth line they are short, the highest point being about 450 feet, while the Caledonian has a sharp pull up to over 1,000 feet, the last ten miles averaging $\frac{1}{80}$. Yet the Caledonian does its journey in 3 minutes less of actual running time.

Thus we see that south of the Thames people pay from half as much again to nearly double what they pay north of it, though the speed in the latter case is so much superior. In railway matters all items of excellence flourish or pine together. The comparatively sorry picture of fewer expresses, higher fares, more unpunctuality, and inferior carriages, to be observed south of the Thames, is a reflection on the people for whom the trains are run.* The North of England towns would not submit to these services, but the

* It is only fair to add that the Brighton line is the least unpunctual of the four Southern ones; this bears out the general fact that those lines which run the most expresses are the most punctual,—simply because they must be—for the Brighton runs most of the four.

crowds of individuals who breathe London air seem incapable of that joint energy which in other localities would soon put an end to such grievances.

We now come to the

GREAT WESTERN.

This is a line of its own sort. It runs both north and south of the Thames, exhibits a corresponding mixture of characteristics, and is altogether anomalous. Its best trains are among the very first in England, but it is, in proportion to its size (much the biggest in the kingdom), more destitute of expresses than any line except the South Western. It offers instances to show what it *could* do, and then proceeds not to do it. But it is improving a little at present, and may soon show a sight more worthy of its permanent way, which is one of the most favourable for express running:—

Distinct Expresses.

Miles.	Between	Number.	Average			
			Time.	Journey-Speed.	Minutes Stopped.	Running-average.
246½	Paddington and Plymouth	4	H. M.			
228	„ Birkenhead..	2	6 7	40½	40	45¼*
170½	„ Cardiff (5.15)	1 (down)	5 16	43½	19	46
129¼	„ Birmingham	2	4 21	39½	25	43½
118½	„ Bristol	6	3 6½	41½	9½	43½
77	Swindon and Padd. (Wey. exp.)	2	2 57½	40	18	44½
75½	Exeter and Bristol (4.55) ...	1 (up)	1 52½	41	6	43½
			1 50	41¼	6	43½
	Total	18	averaging	40¾	and	44½
	Or, reckoning the Plymouth expresses only between Exeter and Paddington	} —	„	42	„	46¼

* This is the running-average *throughout*, but in justice to the trains it should not be reckoned beyond Exeter, where gradients are so heavy ($\frac{1}{40}$) and curves so sharp that express running is out of the question. The running-average of the four Plymouth trains *between Exeter and Paddington* is as high as 50½.

Express Service to Chief Towns.

Miles.	Between London and	Number.	Average			
			Time.	Journey-Speed.	Minutes Stopped.	Running-Average.
			H. M.			
246½	Plymouth	4	6 7	40½	40	45½
228	Birkenhead	2	5 16	43½	19	46
220	Torquay	4	5 21	41	40	47
213	Chester	2	4 57½	43	16½	46½
194	Exeter	4	4 15	45¼	23	50¼
171	Shrewsbury	2	3 53½	44	12½	46½
170½	Cardiff }	1	4 21	39½	25	43½*
158½	Newport }	1	21 min. less	—	—	—
129¼	Birmingham	4	2 56	44	7	46
120	Worcester	1 (down)	2 58	40½	18	45 †
118½	Bristol	10	2 49	42	16	46½
114	Gloucester	1 (down)	2 53	39½	14	43 ‡
106¾	Bath	10	2 30	42¾	13	46¾
77	Swindon	13 (6 up)	1 40¾	46	3½	47¾
63	Oxford	5 (2 „)	1 28	43½	2	44½
122½	Cheltenham	watering place	{ quickest 3.15 = 37¾ journey speed			
168	Weymouth	„	{ quickest 4.20 = 38¾ journey speed			
216	Swansea	{ with population of 65,000, quickest 6.0 = 36 journey speed on the straight route to Ireland from the south of England, quickest 8.0 = 35⅝ journey speed	} “express” service			
285½	Milford					

* Milford boat train.

† 1.45 from Paddington to Birkenhead.

‡ Milford train.

Long Runs. There are twenty-four, averaging 56 miles, at a running-average of 48½:—

6 Paddington and Swindon	1 Oxford and Birmingham
6 Bristol and Taunton	2 Shrewsbury and Chester
2 Swindon and Reading	1 Leamington and Oxford
2 Didcot and Paddington	1 Gloucester and Newport
3 Oxford and Paddington	24

Longest and quickest.—Swindon to Paddington, 77½ miles, in 1 hour 27 minutes = 53½ running-average (done four times).

Express Mileage.—Eighteen expresses, running 2,600 miles, at 46¼ running-average (reckoning none beyond Exeter).

Gradients. The Great Western has very easy gradients as a rule. Between Paddington and Exeter seven-eighths of the distance is practically level (a short drop between Wotton Bassett and Dauntsey, another through Box Tunnel, each 2 miles of $\frac{1}{100}$, are the chief gradients). From Exeter to Plymouth both curves and

gradients are very severe—several miles of $\frac{1}{40}$ —while between Plymouth and Penzance, curves, gradients, and wooden viaducts make such a combination, that the quickest train can only get snatches of speed against a background of caution.

The main line from Dideot to Birkenhead is also very level as a whole; short spells of $\frac{1}{100}$ occur north of Birmingham.

On the third main line, between Swindon and Milford, there is a steep ascent on each side of the tunnel near Stroud, and frequent but still short bits of $\frac{1}{100}$ west of Cardiff, but nothing sufficient to excuse the absence of expresses.

The Great Western Railway is unique in its track, which is broad gauge (7 feet) from Paddington to Penzance—mixed gauge as far as Exeter—and most of its system is laid with the *longitudinal* sleepers.

Best Express.

Miles.	Broad Gauge.		Speed between	Miles.	Narrow Gauge.		Speed between
	—	Time.			—	Time.	
		H. M.				H. M.	
—	Paddington, dep.	3 —	} 53½	—	Paddington dep.	4 45	} 48½
77	Swindon	4 27		63½	Oxford	6 3	
		4 37	} 47			6 7	} 49½
106¾	Bath	5 15		129¼	Birmingham	7 27	
		5 20	} 44			7 30	} 38¾
118½	Bristol	5 36		141½	Wolverhampton	7 49	
		5 41	} 52¾			7 52	} 44¾
163¼	Taunton	6 32		171¼	Shrewsbury	8 32	
		6 35	} 47½			8 35	} 46
194	Exeter	7 14		213½	Chester	9 30	
—	Plymouth arr.	9 —	—			9 33	} 44¼
				228¼	Birkenhead	9 53	
				—	Liverpool (ferry)	10 10	—
Journey-speed = 45¾ } (three others Running-average = 50¾ } like this)				Journey-speed = 44½ { (one other Up Running-average = 47 { a little slower than this)			

The Great Western has not yet entirely emerged from its state of transition. A short time ago it was an unprofitable tangle of separate lines, for the most part ill-conditioned and with miserable accommodation. Now it forms a compact organism of 2,300 miles, with first-rate carriages and permanent way. When the Severn Tunnel is finished, and also that under the Mersey, we may look for two more batches of express trains. It has the smoothest running track in the kingdom, and the speed between Paddington

and Swindon is the highest of any long run in England.* For years the Great Western Railway was far ahead in the van of speed, these "Dutchman" trains running just as they do now about twenty years ago. This was the more wonderful as the permanent way and rolling stock on some parts of the route were decidedly below par.

The reason why the Great Western Railway, which is so scantily supplied with expresses, has those few so very good, is to be found in the fact that its route to many important towns is much longer† than that of the competing lines. Thus the Birkenhead train runs to Birmingham in only 7 minutes more than the quickest North Western express, though the route from Paddington is 16 miles longer, and to Shrewsbury in 1 minute less, the distance being 8 miles more; to Exeter, with a route $22\frac{1}{2}$ miles longer than the South Western, and stopping 5 minutes more on the way, it takes only 11 minutes more.

Owing to the wide intervals between expresses on the Great Western, the general keynote of the service is pitched very low. Porters handle luggage with heartfelt inertia, and the "Dutchman" is kept waiting *en route* in a way unknown in northern latitudes. This train can run well and easily within its time, but whether early or late there is a slackness in its treatment which contrasts strongly with the smart discipline of the other great lines.

"Express fares" were abolished on the Great Western about a year ago, and all its trains are now third class, except the four Exeter expresses and the two limited mails.

GREAT EASTERN.

This again is a line which has lately undergone a pleasant metamorphosis from a state of ludicrous inefficiency into that of a well-equipped and promising express line. It has established a thoroughly good permanent way, built some masterly engines, fitted every train with the Westinghouse brake, and initiated a fresh service to Doncaster. Owing to the crowded suburban traffic which throngs its approaches to London,‡ the first 6 miles

* But in the summer of 1880 the Great Northern ran four Leeds expresses, which did the distances between Grantham and Wakefield, 70 miles, in 1 hour 18 minutes, or $53\frac{4}{5}$ miles an hour, which is slightly faster than the Swindon runs.

† "G.W.R." is proverbially rendered "Great Way Round."

‡ The Chairman recently said that if they could only accommodate "1,000 trains per day" in and out of Liverpool Street, they would all be filled.

have to be run over at such a cautious speed that the "r.a." of expresses is considerably reduced thereby. Unless we bear this in mind, as well as the sharp curves on the Cambridge line, and the slackenings for junctions, bridges, &c., on the Colchester one, the running averages will not give a fair idea of the actual speed over most of the journey.

Distinct Expresses.

Miles.	Between	Number.	Average			
			Time.	Journey-Speed.	Minutes Stopped.	Running-Average.
			H. M.			
*180 $\frac{1}{4}$ —181	{ Liverpool Street and Doncaster	6	4 24	41	20	44 $\frac{1}{3}$
†55 $\frac{1}{2}$ —56 $\frac{1}{4}$	London and Cambridge	10 (4 up)	1 21 $\frac{1}{2}$	41 $\frac{1}{4}$	2 $\frac{1}{2}$	42 $\frac{1}{2}$ ‡
124	{ St. Pancras and Nor- wich (Thorpe)	1 (d.)	3 10	39 $\frac{1}{6}$	14	42 $\frac{1}{4}$
163	{ Norwich (Trowse) and Doncaster.....	2	3 42 $\frac{1}{2}$	44	14 $\frac{1}{2}$	47 §
68 $\frac{3}{4}$	Liverpool St. and Ipswich	8	1 43	40	3 $\frac{3}{4}$	41 $\frac{1}{2}$ ||
51 $\frac{3}{4}$	„ Colchester	5 (2 up)	1 14	42	$\frac{1}{2}$	42 $\frac{1}{4}$ ||
69 $\frac{1}{4}$	{ „ Harwich (Continental)	2	1 48	38 $\frac{1}{2}$	—	38 $\frac{1}{2}$ ¶
		34	averaging	41	and	43 $\frac{1}{4}$

* According as they stop at *Sleaford* or run through by the loop.

† Liverpool Street and St. Pancras.

‡ Two others up, 1 hour 27 minutes = 38 $\frac{1}{4}$ journey-speed.

§ "Fast seaside train."

|| Some of these *should* be Yarmouth and Norwich expresses.

¶ The last few miles run slowly.

Express Service to Chief Towns.

Miles.	Between London and	Number.	Average			
			Time.	Journey-Speed.	Minutes Stopped.	Running-Average.
			H. M.			
180 $\frac{1}{2}$	Doncaster	6	4 24	41	20	44 $\frac{1}{3}$
143 $\frac{1}{2}$	Lincoln	6	3 31 $\frac{1}{2}$	40 $\frac{3}{4}$	15	43 $\frac{2}{3}$
124 {	Norwich, <i>via</i> Ely ...	1 (down)	3 10	39 $\frac{1}{6}$	14	42 $\frac{1}{4}$
114 {	„ <i>via</i> Ipswich	none; 4 av.	3 4 =	37 $\frac{1}{6}$	—	—
121 $\frac{1}{2}$	Yarmouth.....	none; 1 up	3 21 =	36 $\frac{1}{4}$	—	—
68 $\frac{3}{4}$	Ipswich	8	1 43	40	3 $\frac{3}{4}$	41 $\frac{1}{2}$
55 $\frac{1}{2}$ —56 $\frac{1}{4}$	Cambridge	17 (7 up)	1 20 $\frac{1}{2}$	41 $\frac{3}{4}$	2	42 $\frac{5}{8}$
51 $\frac{3}{4}$	Colchester	13 (5 up)	1 13 $\frac{1}{2}$	42 $\frac{1}{4}$	— $\frac{1}{2}$	42 $\frac{1}{2}$

Long Runs.—There are twenty-four, averaging $56\frac{3}{4}$ miles, at $42\frac{1}{2}$ running average ($44\frac{1}{2}$ outside suburbs):—

7	Liverpool Street and Colchester	2	Kentish Town and Cambridge
1	” Mark’s Tey	1	St. Pancras and Cambridge
2	” Ipswich	2	Ely and Trowse
2	” Harwich	1	Norwich and March
6	” Cambridge	24	

The *Longest* is from Liverpool Street to Parkeston Quay, $69\frac{1}{4}$ miles, in 1 hour 46 minutes = $39\frac{1}{2}$ running-average; from Liverpool Street to Ipswich, $68\frac{3}{4}$ miles, in 1 hour 40 minutes = $41\frac{1}{4}$ running-average; and from Trowse to March, $68\frac{1}{2}$ miles, in 1 hour 27 minutes = $47\frac{1}{4}$ running-average (seaside train). The *Quickest* is between Lincoln and Spalding, $38\frac{1}{4}$ miles, in 47 minutes = $48\frac{3}{4}$ running-average.

Express Mileage.—Thirty-four expresses run 3,040 miles, at $43\frac{1}{4}$ running-average (45 outside suburbs).

A propos of the Great Eastern, we must note that the “running-average” of the tables in this paper gives merely what the speed amounts to from *platform to platform*; but in order to compare the “r.a.” of different lines with a view to their proper relative appreciation, we must in each case look at the “r.a.” through the medium of those various personal peculiarities of the line which prevent uniform speed, *e.g.*, gradients, crowded suburbs, junctions to slacken past, sharp curves, swing bridges, &c.

Gradients.—From Liverpool Street to Norwich, *via* Ely, is very easy running. The line rises imperceptibly for 30 miles to Bishop’s Stortford; rises 5 more steeply (the last 2 averaging $\frac{1}{150}$) to Elsenham, 230 feet above sea; falls 4 miles, averaging $\frac{1}{230}$, to Newport; rises slightly to the Audley End tunnels, and falls 15 miles (first 3 averaging $\frac{1}{150}$) gently past Cambridge to the 58th mile. From this there is, except for crossing streams, &c., a dead level of 30 miles to the 88th mile (2 miles past Brandon), then a series of four easy ups and downs, and a sharper drop past Hethersett (3 miles averaging $\frac{1}{130}$); level the last 4 miles into Norwich.

The route from Ely to Doncaster is mostly nearly level. From Ely to Sleaford, 53 miles, it is in the Fens; between Sleaford and Lincoln it rises a little on to the oolite; and from Lincoln to Doncaster again is not far from sea level.

The Colchester route begins with a 19-mile gentle rise (but the last 3 average $\frac{1}{100}$) to Brentwood, 240 feet, and a gentle fall of 11 miles to Chelmsford; the next 22 miles, to Colchester, are level or easy undulations; then steeper ups and downs (averaging $\frac{1}{100}$ to $\frac{1}{150}$) of 3 or 4 miles in length for the next 28 miles; after

which, for 30 miles, from Melton to Beccles, the line is broken up into little ripples, half a mile or a mile long, of steep gradients, averaging worse than $\frac{1}{100}$; and from Beccles, 12 more, less steep, into Yarmouth.

(This line follows the curve of the east coast, and is thus continually crossing (little) transverse valleys; the greatest height between Colchester and Yarmouth is only about 125 feet above sea, near *Westerfield*.)

Best Express.

Miles.		Time.		Speed between
		H.	M.	
	Norwich (Trowse)* dep.	1	50	
68½	March	3	17	47½
		3	20	
88	Spalding	3	45	46½
		3	47	
126¼	Lincoln	4	34	48½
		4	37	
163	Doncaster, ticket station	5	23	48
		5	25	

* This is the "seaside express" taken after Norwich, where the Yarmouth and Lowestoft portions unite. For uniformity of very high speed this is one of our finest trains.

Journey-speed = 45½.

Running-average = 47½.

Now we come to the great lines connecting London with Lancashire and Yorkshire. Here we are in an atmosphere of expresses, and the pitch is raised. On the *Great Northern*, *Midland*, and *North Western* we have performances excellent all round; speed and punctuality become objects of hearty attachment, slow trains are in a minority, carriages are very good, fares low, and all expresses third class.*

Of these three great lines, the Great Northern and Midland rank far above the North Western, not in number of expresses, but in speed. The running totals are—

	Miles.	Running-average.	
Great Northern	6,780	at	46½
Midland	8,860	,,	45
North Western	10,400	,,	43½

* Except the *Irish* mails, which are first and second express fares, and the two nine-hour expresses between King's Cross and Edinburgh, which are first and second ordinary.

but as the North Western is much the most level of the three, the superiority of the other two is greater than the figures indicate. Between the Midland and Great Northern, considering the steep gradients of the former, it might be difficult to apportion merit; but the Great Northern has long been the fugleman in matters of speed, because what it undertakes to do on paper, it does on the metals with exemplary punctuality. At present it is running within itself, for in the year 1880, during the summer months, it ran four trains between Leeds and King's Cross in $3\frac{3}{4}$ hours, a *journey-speed* of $49\frac{1}{2}$!

The Great Northern is a comparatively small line, and not only heads the list for speed, but, in proportion to its length and the population served, provides many more expresses than any other company. The rest of the world outside England cannot show so much high speed.

GREAT NORTHERN.

Distinct Expresses.

Miles.	Between	Number.	Average			
			Time.	Journey-Speed.	Minutes Stopped.	Running-average.
			H. M.			
138½	{ King's Cross and Retford (<i>Manchester and Leeds</i> trains)	10	3 6½	44½	10	47
47	{ Retford and Leeds	5 (3 up)	1 11	40	7	44
185½	{ King's Cross and Leeds	7 (4 up)	4 18	43	19	46½
32	{ Doneaster and York	4 (1 up)	— 47	41	5	45¾
105½	{ King's Cross and Grant-ham (new <i>Manchester</i> expresses)	4	2 5	50¾	—	50¾
188	{ King's Cross and York } (<i>Scotch</i> expresses)	9 (5 up)*	4 14¾	44¼	12¼	46½
188	King's Cross and York only	3 (2 up)	4 24	42¾	20	46½
90	Nottingham and York	2	2 15	40	12	44
127¾	{ " King's } Cross (8.12 up)	1	2 52	44½	12	48
22¼	Nottingham and Grantham	11 (6 up)	— 31	43	—½	43¾
24¾	Lincoln and Grantham	4	— 36	41¼	2	43¾
58	Cambridge and King's Cross	7 (5 up)	1 21½	42¾	4	45
		48 chief,	averaging	43½	and	46¾†
		19 auxiliary	„	42½	„	44¼†
	Total	67	averaging	43	and	46¾§

* The 8 P.M. from King's Cross is not reckoned, as it only runs for a month.

† For 6,307 miles.

‡ For 472 miles.

§ For 6,780 miles.

Service to Chief Towns.

Miles.	Between London and	Number.	Average			
			Time.	Journey-Speed.	Minutes Stopped.	Running-average.
			H. M.			
237 $\frac{1}{2}$	Liverpool	5 (2 up)	5 59	39 $\frac{2}{5}$	39	44 $\frac{1}{2}$
203	Manchester	14	4 51	41 $\frac{5}{6}$	20	45
199 $\frac{3}{4}$	Stockport	7 (3 up)	5 3	39 $\frac{1}{2}$	31	44
199 $\frac{1}{2}$ *	Halifax	7 (2 „)	4 53 $\frac{1}{2}$	40 $\frac{3}{4}$	28	45
197	Hull	3 (1 „)	4 56	40	31	44 $\frac{2}{3}$
193 *	Bradford	9 (4 „)	4 35	42	25	45 $\frac{1}{3}$
188	York	19 (9 „)	4 20	43 $\frac{2}{5}$	17	46 $\frac{2}{5}$
185 $\frac{1}{2}$	Leeds	13 (7 „)	4 21	42 $\frac{2}{3}$	20 $\frac{1}{2}$	46 $\frac{1}{4}$
162	Sheffield	17 (8 „)	3 39 $\frac{1}{2}$	44 $\frac{1}{3}$	13	47
156	Doncaster	21 (9 „)	3 35	43 $\frac{1}{2}$	14 $\frac{1}{2}$	46 $\frac{2}{3}$
130 $\frac{1}{4}$	Lincoln	6 (2 „)	3 11	41	22	46 $\frac{1}{4}$
127 $\frac{3}{4}$	Nottingham	19 (10 „)	3 0 $\frac{1}{2}$	42 $\frac{1}{2}$	15 $\frac{1}{2}$	46 $\frac{1}{2}$
105 $\frac{1}{2}$	Grantham	36 (19 „)	2 17 $\frac{1}{2}$	46	5	47 $\frac{3}{4}$
76 $\frac{1}{4}$	Peterborough	29 (16 „)	1 37	47	2	48 $\frac{1}{6}$
58	Cambridge	7 (5 „)	1 21 $\frac{1}{2}$	42 $\frac{2}{3}$	4	45 †

* Average distance.

† *Cambridge* is peculiarly well served for its size and importance. See Table IX.

Long Runs.—There are forty-nine, averaging 73 $\frac{3}{4}$ miles, at 50 running-average:—

Longest—

Miles. H. M. r.a.
Grantham and King's Cross 105 $\frac{1}{2}$ in 2 4=51 (2 up *Manch.* exp.)

Quickest—

Grantham to Doncaster.... 50 $\frac{1}{2}$ in - 58=52 $\frac{1}{4}$ (1.15 down)

7 King's Cross and Grantham	3 Hitchin and Peterborough
1 Grantham and Finsbury Park	1 Sandy and Finsbury Park
4 „ York	5 Doncaster and Grantham
6 King's Cross and Peterborough	2 Retford and York
18 Finsbury Park and Peterborough	1 York and Newark
1 Huntingdon and Finsbury Park	49

Express Mileage.—Sixty-seven expresses run 6,780 miles at 46 $\frac{1}{2}$ running-average (500 miles of which is on very steep gradients north of Wakefield).

Gradients.—The gradients of the three chief lines may be briefly compared. The Great Northern, ending in the latitude of Leeds, escapes the severe gradients which the Midland and North Western encounter in the Westmoreland hills. But, reckoning

south of these hills, the *North Western* from Euston to Liverpool and Manchester is the easiest route, the chief gradient being $\frac{1}{330}$. The *Great Northern* to York comes second, having long pulls of $\frac{1}{200}$ to $\frac{1}{178}$ between King's Cross and Grantham, though from Grantham to York it is nearly level. The *Midland* has a series of heavy ups and downs between St. Pancras and Leicester, gradients chiefly $\frac{1}{176}$, $\frac{1}{132}$, and $\frac{1}{120}$. From Leicester to Leeds it is very easy (except the loop through Sheffield, see p. 544). The Liverpool and Manchester trains branching off at Derby, however, have very steep gradients ($\frac{1}{90}$) over the Peak Forest route, 1,000 feet above sea.

The steep portions of each company's route will be described later on, in connection with certain Long Runs done over them.

Here we give the *best express* of each of the three lines for comparison:—

Great Northern.				Midland.				North Western.			
Miles		Time.	Speed.	Miles.		Time.	Speed	Miles.		Time.	Speed.
		H. M.				H. M.				H. M.	
—	King's Cross	1 15	} 50 $\frac{1}{2}$	—	St. Pancras	10 0	} 49 $\frac{1}{3}$	—	Birmingham	7 30	—
76 $\frac{1}{4}$	Peterboro'	2 45		72 $\frac{1}{4}$	Kettering...	11 27		3 $\frac{3}{4}$	Stechford....	7 38	—
		2 48				11 31				7 39	
105 $\frac{1}{2}$	Grantham	3 26	} 46	124	Nottingham	12 35	} 48 $\frac{1}{2}$	19	Coventry	7 59	} 45 $\frac{2}{3}$
		3 30				12 41				8 1	
156	Doncaster	4 28	} 52 $\frac{1}{4}$	164 $\frac{1}{2}$	Sheffield	1 35	} 45	30 $\frac{1}{4}$	Rugby	8 17	} 42 $\frac{1}{5}$
		4 33				1 40				8 20	
174	Selby	4 56	} 47 $\frac{1}{2}$	204	Leeds	2 30	} 47 $\frac{2}{3}$	107 $\frac{1}{2}$	Willesden	9 52	} 50 $\frac{2}{3}$
		4 58								9 55	
187 $\frac{3}{4}$	York, ticket station ...	5 17	} 43 $\frac{2}{3}$					113	Euston.....	10 5	—
188				5 20							
Journey-speed = 46 Running-average = 49 $\frac{1}{4}$				Journey-speed = 45 $\frac{1}{3}$ Running-average = 48				Journey-speed = 43 $\frac{1}{4}$ Running-average = 46 $\frac{3}{4}$			

MIDLAND.

This line is remarkable for high speed in the face of severe gradients. It is also to be admired for the *uniform* excellence and symmetrical running of its trains, the roominess of its carriages, and the energy with which it has developed "through" services.

It has opened up "cross-country" (*i.e.*, not to and from *London*) communication more than any other Company, as witness the capital services between Bournemouth, Bath, & Bristol, and Liverpool, Manchester, York, Leeds, Hull, & Newcastle. Its engines have nearly one-third of their time occupied in ascending very steep (for an express) gradients, but they have adapted themselves well to their task. For instance, we may compare the slow speed (about 15 miles an hour) at which the Great Western "Dutchman" emerges from the east end of *Box* tunnel,* after only 2 miles of $\frac{1}{100}$, with the heavy load which the Midland Scotch Express pulls up from near *Settle* to *Blea Moor* tunnel at an average of 37 miles an hour, a continuous ascent of 15 miles $\frac{1}{100}$ (except a mile). The run by this same train from St. Pancras to Leicester (99 miles in 2 hours 7 minutes), and that by the night express from Skipton to Carlisle ($86\frac{3}{4}$ miles in 1 hour 55 minutes), are a credit to English workmanship (see pp. 561, 564).

The Midland expresses between Derby and Manchester give a journey containing some of the loveliest views in England, and the panorama seen from the Westmoreland heights at 70 miles an hour is such as few travellers are aware of.† It is true that in America or elsewhere we ascend to much greater heights, but without the ingredient of such speed to set off the sight; in other countries hills make an end of the speed: in England it is *vice versa*.

* This tunnel (oolite) has long borne the false imputation of being 4 or 5 miles in length. It is only 3,193 yards—the Festiniog is $2\frac{1}{4}$, the Woodhead and Standedge 3 miles each—but it rises $\frac{1}{100}$ (from west to east), which fact, coupled with the disinclination of broad-gauge engines to go up hill (because they have little extra-normal capacity), is responsible for the error.

† In summer time the Midland should run a carriage with projecting glass sides, and charge cheap fares for factory hands to see the sight there is between Leeds and Carlisle.

Distinct Expresses.

Miles.	Between	Number.	Average			
			Time.	Journey-Speed.	Minutes Stopped	Running-average.
191 $\frac{1}{4}$	St. Pancras and Manchester*	11 (6 up)	H. M. 4 43 $\frac{3}{4}$	40 $\frac{1}{2}$	25 $\frac{1}{2}$	44 $\frac{1}{2}$
91 $\frac{1}{4}$	Derby and Liverpool	6	2 7	43 $\frac{1}{4}$	5 $\frac{1}{2}$	45 $\frac{3}{4}$
42 $\frac{3}{4}$	Marple "	4	1 4	40	4	42 $\frac{3}{4}$
204	St. Pancras and Leeds, <i>via</i> Melton	9 (5 up)	4 34 $\frac{1}{2}$	44 $\frac{1}{2}$	17	47 $\frac{1}{2}$
164 $\frac{1}{2}$	Sheffield and St. Pancras	1 (up)	3 40	44 $\frac{3}{4}$	14	48
307 $\frac{3}{4}$ —9 $\frac{3}{4}$	St. Pancras and Carlisle (<i>Scotch exp.</i>)†	6	7 30	41	38	45
112 $\frac{3}{4}$	Leeds and Carlisle (<i>Leeds, Liverpool,</i> <i>Manchester, to Scotland</i>)‡	4	2 54	39	15	42 $\frac{1}{2}$
62 $\frac{1}{2}$	Derby and Manchester (<i>night trains</i>)..	2 (down)	1 34	40	4	41 $\frac{2}{3}$
37 $\frac{1}{2}$	Stockport and Liverpool (same trains)	2 "	— 55 $\frac{1}{2}$	40	4	44
75 $\frac{1}{2}$	Derby and Leeds (local)	4 (1 up)	1 53	40	10	44
82 $\frac{1}{2}$	York and Derby (<i>for W. of England</i>)	2	2 —	41 $\frac{1}{4}$	8	44
130 $\frac{3}{4}$	Bristol and Derby	3 (1 up)§	3 15	40 $\frac{1}{4}$	14	43 $\frac{1}{3}$
40	Milford Junction and Hull	8	— 56	43	2	44 $\frac{2}{3}$
62	Buxton and Liverpool (through trains)	2	1 23 $\frac{1}{2}$	44 $\frac{1}{2}$	2	45 $\frac{2}{3}$
128 $\frac{3}{4}$	St. Pancras and Derby (12.25 <i>Buxton</i>)	1 (down)	3 10	40 $\frac{3}{4}$	18	45
91 $\frac{1}{2}$	Liverpool and Derby (up <i>Bristol exp.</i>)	1	2 15	40 $\frac{3}{4}$	7	43
Total		66	averaging	41 $\frac{3}{5}$	and	45

* Ten of these serve both Manchester and Liverpool, the Liverpool portion coming on and off at Derby and Marple. The eleventh (up) is from Manchester only.

† Average distance, 308 $\frac{3}{4}$ miles.

‡ Mostly hill gradients. The Liverpool and Manchester portions join at *Hellifield*.

§ Two each way, but the other up is not so fast.

Service to Chief Towns.

	Miles.	Between London and	Number.	Average.			
				Time.	Journey-Speed.	Minutes stopped.	r.a.
				H. M.			
*307 $\frac{3}{4}$ —310		Carlisle	7 (3 up)	7 29 $\frac{1}{2}$	41 $\frac{1}{4}$	40	45 $\frac{1}{4}$
220 $\frac{1}{4}$		Liverpool	10	5 21	41 $\frac{1}{5}$	30	45 $\frac{3}{5}$
Old route 209 $\frac{1}{2}$ —211 $\frac{1}{2}$		Bradford {	4	5 5	41 $\frac{2}{5}$	25	45 $\frac{1}{5}$ †
<i>Via</i> Melton 217 $\frac{1}{2}$		9 (5 up)	9 (5 up)	5 5	42 $\frac{1}{5}$	24	46 $\frac{1}{5}$ †
Old route 196—198		Leeds	6 (2 ")	4 42 $\frac{1}{2}$	42	21 $\frac{1}{2}$	45 $\frac{3}{4}$ †
<i>Via</i> Melton 204		9 (5 ")	9 (5 ")	4 34 $\frac{1}{2}$	44 $\frac{1}{2}$	17	47 $\frac{1}{2}$ †
191 $\frac{1}{4}$		Manchester	11 (6 ")	4 43 $\frac{3}{4}$	40 $\frac{1}{2}$	25 $\frac{1}{2}$	44 $\frac{2}{3}$
182 $\frac{1}{2}$		Stockport	11 (6 ")	4 32	40 $\frac{1}{4}$	27	44 $\frac{3}{4}$
Old route 158 $\frac{1}{2}$		Sheffield {	3 40 $\frac{3}{5}$	43	14	46 $\frac{3}{5}$	
<i>Via</i> Melton. 164 $\frac{1}{2}$		10 (6 up)	3 40	44 $\frac{2}{5}$	13	47 $\frac{2}{5}$ §	
128 $\frac{3}{4}$		Derby	15 (7 ")	3 1 $\frac{1}{2}$	42 $\frac{1}{2}$	15	46 $\frac{1}{2}$||
<i>Via</i> Melton 138 $\frac{1}{2}$		6	3 21	41	22	46 $\frac{1}{2}$ ¶	
" Trent 126 $\frac{1}{2}$		Notting- {	6 (2 up)	3 —	42 $\frac{1}{5}$	15 $\frac{1}{2}$	46 $\frac{1}{5}$ ¶
" Kettering 124		ham	10	2 40	44 $\frac{2}{5}$	7	48 $\frac{2}{5}$ ¶
99 $\frac{1}{4}$		Leicester	20	2 14	44 $\frac{1}{2}$	7	47
49 $\frac{3}{4}$		Bedford	17 (9 up)	1 8	44	2 $\frac{1}{2}$	45 $\frac{1}{2}$

* Some run *via* Sheffield, some *via* Staveley and Eckington.

† Thirteen average 46 r.a.

‡ Fifteen average 46 $\frac{2}{3}$ r.a.

§ Sixteen average 47 r.a.

|| Twenty-one average 46 $\frac{1}{2}$.

¶ Sixteen average 47 $\frac{2}{3}$ r.a.

Long Runs.—There are one hundred and four averaging 53 miles, at $46\frac{1}{2}$ running-average (sixteen of these are contingent on picking up and setting down), of which twenty-four average 74 miles at $46\frac{3}{4}$ running-average, and sixteen average 66 miles at 44 running-average, *over hill gradients* (Derbyshire, Westmoreland, &c.).

10 London and Kettering	2 Marple and Liverpool
10 Kettering and Nottingham	1 Buxton "
9 Nottingham and Sheffield	1 " Warrington
12 Sheffield and Leeds	1 Derby and Liverpool
5 St. Pancras and Bedford	1 Mill. Dale and Liverpool
9 Kent. Tn. "	4 Saltley and Cheltenham
15 Leicester "	1 Belper and Stockport
2 St. Pancras and Leicester	1 Masborough and York
2 Trent and Normanton	12 in Westmoreland district
1 Leicester and Luton	
2 Marple and Derby	104
3 Stockport and Derby	

Longest—

	Miles.	n.	m.	r.a.
St. Pancras to Leicester	99 $\frac{1}{4}$	in	2	7 = 47

Quickest—

St. Pancras to Kettering	72 $\frac{1}{4}$	„	1	27 = 49 $\frac{4}{5}$	(10.0 down) hilly run.
Liverpool to Stockport	37 $\frac{3}{4}$	„	-	45 = 50 $\frac{3}{5}$	With or without a stoppage.
Skipton to Carlisle.....	86 $\frac{3}{4}$	„	1	55 = 45 $\frac{1}{4}$	Very steep.
Bedford to Kent. Tn.....	48	„	1	- = 48	{ Steep. Run by all the <i>Manchester</i> expresses in the hour.

Express Mileage.—Sixty-six expresses run 8,860 miles, at 45 running-average.

Gradients.—Those between St. Pancras and Leicester, and Skipton to Carlisle, will be given in detail later. From Leicester to Leeds is nearly level, except that those trains which run *via Sheffield* have 5 miles $\frac{1}{100}$ up, and 6 miles $\frac{1}{100}$ down at the Bradley tunnel. From Leeds to Skipton the line rises easily. The steep piece between Derby and Manchester will be given later.

Best Express.—This has already been given with the Great Northern. Here we will take the best express of each of the three lines to *Manchester*, for which town competition is keener than for any other:—

GREAT NORTHERN. (M. S. & L. from Retford to Manch.)				MIDLAND.				NORTH WESTERN.			
Miles		Time.	Speed	Miles.		Time.	Speed.	Miles		Time.	Speed.
		H. M.				H. M.				H. M.	
—	Manchester	11 0	} 40 $\frac{1}{3}$	—	{ Manchester (Central) ..	3 45	} 40	—	Manchester	11 15	} 32
41	Sheffield	12 1 12 5		31 $\frac{1}{4}$	Miller's Dale..	4 32 4 35		4 $\frac{3}{4}$	4 $\frac{3}{4}$	Stockport.....		11 24 11 25
97 $\frac{1}{2}$	Grantham...	1 21 1 26	} 44 $\frac{2}{3}$	62 $\frac{1}{2}$	Derby	5 16 5 21	} 45 $\frac{2}{3}$	14	Alderley Edge	11 40 11 41	} 38
203	King's Cross	3 30		92	Leicester	5 59 6 4		31	Crewe	12 6 12 15	
				141 $\frac{1}{2}$	Bedford	7 6 7 10	} 48	106 $\frac{1}{4}$	Rugby	1 50 1 58	} 47 $\frac{1}{2}$
				161	Luton	7 36 7 37		183 $\frac{1}{2}$	Willesden	3 32 3 35	
				189 $\frac{1}{2}$	Kentish Town	8 13 8 16	} 47 $\frac{1}{2}$	189	Euston.....	3 45	} 33
				191 $\frac{1}{4}$	St. Paneras	8 20					
Journey-speed = 45.				Journey-speed = 41 $\frac{3}{4}$.				Journey-speed = 42.			
Running-average = 46 $\frac{2}{3}$.				Running-average = 45 $\frac{1}{6}$.				Running-average = 45 $\frac{2}{3}$.			
Exp. 14	{ 2 trains each way like this. 10 others express.			Exp. 11	{ 2 others (down) take 4 hours 40 minutes. 8 others express.			Exp. 17	{ 3 do it in this time (2 up). 2 others (down) take 4 hours 35 minutes. 12 others express.		

The log of these three trains is characteristic. There is an heroic simplicity about that of the Great Northern, which, having a route 12 miles the longest and a course the hardest of the three, straightway proceeds to do its journey in the same time.

The Midland stops wherever it can absorb passengers, and works hard the whole way, taking gradients as part of the day's programme.

The North Western as usual dallies so much over a small section of the route, that it makes the running-average of the whole run considerably less than it need be. It runs from *Liverpool*, 193 $\frac{1}{2}$ miles, in the same time, 4 $\frac{1}{2}$ hours.

NORTH WESTERN.

This is the old established railway firm, and does a larger business than either of its more energetic rivals. Being the first

made, it has easier gradients, and has had a longer time to form trade connections. Its route is also the shortest to many of our busiest towns. For these reasons it is much the wealthiest of our great companies, and probably earns its revenue more easily. But, from an express point of view, it is slack compared with the Great Northern or Midland; it runs more expresses, only at a lower speed. This is partly because competition merely requires it to serve towns in the same time as the other two lines; and, being generally on the short route, it need not run so fast. Also its main line is so thronged with fast trains, that any acceleration, affecting such a number, is more tardily proposed. Running so many expresses on one main line (south of Crewe), its punctuality and discipline are first class, and hence accidents are very uncommon.

The express service of the North Western to *Liverpool* and *Birmingham* is considerably spoilt by the waiting at Crewe and Rugby of several trains, and by the slow running on the parts between Crewe and Liverpool and Rugby and Birmingham. Thus, though Manchester has 17 expresses, Liverpool has only 10, in spite of the North Western being the direct thoroughfare from London to America. Birmingham has but 8 trains which can possibly be called express, though between Rugby (which is only 30 miles off) and Euston there are 50. In fact, Birmingham is, for its size, very poorly served, having a total (North Western and Great Western) of 12 against 28 for Leeds, which is so much farther away. Liverpool, too, cannot boast of obtaining its due speed from the North Western; it is the same distance from Euston as Exeter from Paddington, but its fastest train is 16 minutes longer than the "Dutchman" (which latter stops more on the journey).

There is *no express service* between two such important towns as *Manchester* and *Leeds*; the two quickest take 1 hour 20 minutes, a journey-speed of only 32, which compares badly with that of the Manchester, Sheffield, and Lincolnshire between Manchester and Sheffield, over twice the obstacles (see p. 552).

The *Irish Mail Service*, of which the North Western has the monopoly, is not much credit to the Company. These trains are limited to 1st and 2nd class at express fares, and yet are the slowest of any of the expresses run to an important place. The "running-average" of the quickest (7.15 down) is only $43\frac{3}{5}$, and the running-average of the four trains only $42\frac{1}{4}$. The acceleration of half an hour lately promised to the Government will hardly raise the "journey-speed" to 44, a speed very good, but lower than that which Leeds and Manchester obtain without a premium from Government.

The smartest running of the North Western is that of its

twenty expresses on the old line between Liverpool and Manchester, and two of its up expresses from Birmingham; the former, over a short course, have a running-average of 48, and the latter exceed 50 between Rugby and Willesden.

Distinct Expresses.

Miles.	Between	Number.	Average			
			Time.	Journey-Speed.	Minutes Stopped.	Running-Average.
			H. M.			
31½	Liverpool and Manchester (Vict.) (1 goes to Lond. Road in 50 min.)	20	- 45	42	3	45*
182½-191	Euston and Manchester (the 16 trains average 188·9 miles)	16	4 43	40	24½	43½
193½	Euston and Liverpool only	2 (up)	4 30	43	17	46
35½	Crewe "	5 (3 up)	- 55	38¾†	4	41½
60	Stafford "	3 (1 ")	1 35	38†	9	42½
299¼	Euston and Carlisle (Scotch express)	7 (4 up)	7 28½‡	40	34½	43½
263¾-5¾	Euston and Holyhead (Irish Mail) (1 viâ Northampton; the 4 average 264½)	4	6 42½	39½	24	42
113-115	Euston and Birmingham (5 viâ Northampton; the 7 average 114½)	7 (3 up)	2 46	41¾	13	45
158-160	Euston and Crewe (3 viâ Northampton)	7 (2 up)	3 57	40¼	20	44
82¾-84¾	Euston and Rugby (average 84 miles)	8§	2 3½	40⅝	7	43¼
90	Preston & Carlisle (trains from Liverpool & Manchester to Scotland)	3 (2 up) ||	2 13	40⅝	6	42¼
Total		54 chief, 28 auxiliary	averaging " "	40½ 41	and "	Miles. 43¾ r.a. for 9,418 44 " 987
		82	averaging	40⅝	and	43⅞ " 10,405

* The running-average is 48 when clear of the Edge Hill Tunnel.

† Only admitted through the excuse of Edge Hill Tunnel.

‡ Two others up average 7¼ hours = 38¾ journey-speed, but not admitted because the proportion of hilly route to such a long journey is not enough to excuse the speed. The 7.30 P.M. from Euston is not counted, as it only runs a short time.

§ These are really main line residues of trains which are meant for express to Liverpool and Manchester or Birmingham.

|| Giving, with the seven other Scotch expresses, a total of ten expresses between Preston and Carlisle.

Service to Chief Towns.

Miles.*		Number.	Average			
			Time.	Journey-Speed.	Minutes Stopped.	r.a.
299 $\frac{1}{4}$	Carlisle	7 (4 up)	7 28 $\frac{1}{2}$	40	34 $\frac{1}{2}$	43 $\frac{1}{2}$
209 $\frac{1}{4}$	Preston	8	5 6	41	24	44 $\frac{1}{2}$
193 $\frac{1}{2}$ —195 $\frac{1}{2}$	Liverpool (3 <i>via</i> North ^m)...	10 (6 up)	4 45	40 $\frac{6}{7}$	25	44 $\frac{3}{4}$
182 $\frac{1}{2}$ —191	Manchester	17 (8 „)	4 46	39 $\frac{2}{3}$	24 $\frac{1}{2}$	43 $\frac{1}{2}$ †
177 —185 $\frac{1}{2}$	Stockport	„	10m. less	—	—	—
182 $\frac{1}{4}$ —184 $\frac{1}{4}$	Warrington (2 <i>via</i> North ^m)	12	4 33	40	26	44 $\frac{1}{4}$
179	Chester (1 <i>via</i> North ^m)	9 (4 up)	4 25	40 $\frac{3}{4}$	21	44
163	Shrewsbury	3 (1 „)	4 3	40 $\frac{1}{4}$	24	44 $\frac{3}{4}$
158—160	Crewe (4 <i>via</i> North ^m)	3† (16 „)	3 48	41 $\frac{2}{3}$	15 $\frac{1}{2}$	44 $\frac{3}{4}$
113—115	Birmingham (5 <i>via</i> North ^m)	8	2 45 $\frac{1}{2}$	41 $\frac{1}{5}$	12 $\frac{1}{2}$	44 $\frac{3}{4}$
82 $\frac{3}{4}$ —84 $\frac{2}{4}$	{ Rugby (21 <i>via</i> North ^m). } { Av. distance 83 $\frac{1}{2}$ miles }	50	1 57	42	5	44 $\frac{4}{5}$
65 $\frac{3}{4}$	Northampton	21 (9 up)	1 32	43	4	44 $\frac{4}{5}$

* The North Western distances are varied by many of the trains running on the Northampton Loop instead of *via* Kilsby Tunnel. This makes the run two miles longer. In the case of Manchester, trains run either *via* Crewe, 189 miles, or *via* Stafford and Norton Bridge, 186 $\frac{1}{2}$ miles, or *via* Rugeley Junction and Stone, 182 $\frac{1}{2}$ miles; and any of these trains running *via* Northampton has two miles extra; thus the Manchester distances vary from 191 to 182 $\frac{1}{2}$ miles.

† 13 trains run *via* Crewe and 5 of these *via* Northampton.

3 „ „ Stafford and 1 of these *via* Northampton.

1 „ „ Colwich.

The average distance is 189 miles.

Long Runs.—There are ninety-eight, averaging 60 miles, at 45 running-average (this is really more long runs than the *Midland*, because several of the latter are contingent on signal to pick up or set down), of which fifty-three (over 60 miles) average 72 miles at 44 running-average, and twelve, *over Westmoreland hills*, average 60 $\frac{3}{4}$ miles, at 43 running-average.

1 Euston and Nuneaton	6 Crewe and Nuneaton
2 „ „ Rugby	2 „ „ Preston
13 Willesden and „	9 Rugby and Stafford
11 „ „ Northampton	1 „ „ Leighton
20 „ „ Bletchley	1 Bletchley and Euston
1 Euston and Northampton	1 Chester and Stafford
1 Rugby and Watford	5 „ „ Holyhead
1 Willesden and Roade	2 „ „ Bangor
1 „ „ Weedon	12 over Westmoreland hills
1 „ „ Blisworth	—
7 Crewe and Rugby	98

Longest—

Miles.	H. M.	r.a.
Nuneaton to Willesden.....	91 $\frac{1}{2}$ in	1 57 = 47 (up day Scotch express)

Quickest—

Northampton to Willesden	60 $\frac{1}{4}$ „	1 10 = 51 $\frac{3}{4}$ (9.30 up from Birmgm.)
Rugby to Willesden	77 $\frac{1}{4}$ „	1 32 = 50 $\frac{1}{2}$ (7.30 „)
Carlisle to Carnforth (over 915 feet)	62 $\frac{3}{4}$ „	1 25 = 44 $\frac{1}{4}$ (night mail)

Best Express.—This has been already given with the Great Northern. Here we will take the best *Scotch* express of each of the three great lines:—

East Coast Route.				Midland Route.				West Coast Route.			
Miles.		Time.	Speed	Miles		Time.	Speed	Miles		Time.	Speed
		A. M.				A. M.				A. M.	
—	Glasgow....dep.	8 40	—	—	St.Pancras dep	10 35	47	—	Euston dep.	10 —	—
1½	Cowlairs.....	8 46	—	99¼	Leicester	12 42	47	5½	Willesden	10 9	—
		8 48				12 46				10 12	
25	Polmont Jtn.	9 19	45½	120	Trent	1 14	44½	82¾	Rugby	11 55	45
		9 20				1 17				12 —	
46	{ Haymarket	9 50	42	185¼	Normanton ...	2 40	47	158	Crewe.....	1 36	47
		9 52				3 10				1 43	
47¼	{ Edinb.(War.)	9 55	—	221½	Skipton	4 2	41½	209¼	Preston	2 50	46
		10 —				4 5	44½			3 10	
104¼	Berwick	11 15	46	277½	Appleby	5 21	44½	299¼	Carlisle	5 20	41½
		11 20				5 24				5 28	
171½	Newcastle	12 45	47	307¾	Carlisle ....arr.	6 5	44½	339	Beattock	6 16	49½
		12 50								6 19	
207½	Darlington.....	1 38	45		„ dep.	6 12	42½	372¾	Carstairs ....arr.	7 4	45
		1 41		353¼	Hawick	7 16					
251¼	York	2 35	49½			7 17	39		„ dep.	7 7	41¼
		3 5		369	Melrose	7 41		400¼	{ Edinburgh, }	7 47	
334¼	Grantham	4 44	50			7 42	—		{ ticket stn. }	7 50	
		4 50		372½	Galashiels ...	7 49		—	Carstairs dep.	7 6	
439¾	King's Cross	7 —	48¾			7 52	40½	383½	Law Junction	7 21	39
				406	Edinburgh ...	8 42				7 23	31
				—	Carlisle....dep.	6 12	47	400½	Glasgow,Egl.St.	7 56	—
				340¾	Dumfries	6 54		401½	„ Central	8 —	
						6 57	44½				
				399¼	Kilmarnock...	8 17					
						8 20	40¼				
				423	Glasgow	8 55					

j.s. = 42½ } from Glasgow.
r.a. = 47 }
j.s. = 43½ } „ Edinburgh.
r.a. = 48 }

The *North British* Company work these trains between Glasgow and Edinburgh; the *North Eastern* between Edinburgh and York; and the *Great Northern* York and London.

j.s. = 40½ } to Glasgow.
r.a. = 45 }
j.s. = 40½ } „ Edinburgh
r.a. = 44½ } (much slower).

The *Midland* work as far as Carlisle, from which the *North British* take the Edinburgh and the *Glasgow and South Western* the Glasgow portions.

j.s. = 40½ } to Glasgow.
r.a. = 44 }
j.s. = 40½ } „ Edinburgh.
r.a. = 44½ }

Worked by the *North Western* to Carlisle, and by the *Caledonian* beyond. This latter Company mounts the hill of 1,015 feet between Beattock and Carstairs at a very good speed indeed.

Of these three journeys, speaking roughly, the *Midland* has the severest route, rising to 1,170 feet in Westmoreland, and in the

Lowlands to 950 and 850 feet respectively, with a drop of 600 feet between. The *North Western* is considerably easier, chiefly from the gentle gradients south of Preston; it rises to 915 feet in Westmoreland, and 1,015 and 880 feet in the Lowlands, with a drop of 250 feet between. The East coast route is never so high as 400 feet (360 feet at Knebworth, Herts, and 380 at Grant's House, north of Berwick).

While we are examining Scotch expresses, we may, in passing, compare the *Limited mail* of the *North Western*, by no means one of our very best trains, with the very best *long distance* train on the Continent, that of the *Paris, Lyons, & Méditerranée*. The English train is third class; the French one "first only:"—

Miles.		Time.	Speed.	Miles.		Time.	Speed.
—	Euston, dep.	P. M. 8 50	} 45	—	Paris†.....	A. M. 8 55	36
82 $\frac{3}{4}$	Rugby	10 40					
110	Tamworth	10 44	} 45	49	Montereau	10 17	41 $\frac{1}{2}$
133 $\frac{1}{2}$	Stafford	11 20				10 20	
158	Crewe.....	11 24	} 45 $\frac{1}{2}$	96 $\frac{1}{2}$	Laroche	11 28	41 $\frac{3}{4}$
194	Wigan	11 55				11 31	
209 $\frac{1}{4}$	Preston	11 59	} 46 $\frac{3}{4}$	122 $\frac{1}{4}$	Tonnerre	12 8	39 $\frac{1}{2}$
299 $\frac{1}{4}$	Carlisle	12 32		195 $\frac{1}{2}$	Dijon	12 33	
372 $\frac{3}{4}$	Carstairs	12 38	} 48 $\frac{1}{2}$ *	273 $\frac{3}{4}$	Macon	2 24	42
389	Holytown Junction	1 24				2 29	
393 $\frac{1}{2}$	Coatbridge.....	1 30	} 36	314 $\frac{3}{4}$	Lyons	4 21	34 $\frac{1}{2}$
409	Larbert	1 53		383 $\frac{3}{4}$	Valence	4 26	
417 $\frac{1}{4}$	Stirling	1 57	} 40 $\frac{1}{2}$			5 37	40
450 $\frac{1}{2}$	Perth { Tickets	7 7		460 $\frac{3}{4}$	Avignon	6 8	
	{ Station	7 24	} 40			7 51	42 $\frac{1}{2}$
	{ dep.	8 15		536	Marseilles	7 56	
482 $\frac{3}{4}$	Forfar	9 5	} 39 $\frac{1}{2}$			9 45	38 $\frac{2}{3}$
498 $\frac{1}{4}$	Bridge of Dun.....	9 55				9 50	
		9 59	} 32			11 47	
		10 28					
		10 29	} 37				
		11 37					
		11 40					
Journey-speed = 36 $\frac{2}{3}$. Running-average = 41 $\frac{1}{2}$.				Journey-speed = 36. Running-average = 39 $\frac{3}{4}$.			

* There is a stop at the summit of ascent for four minutes. Beattock is 350 feet above sea, and the summit 1,015 feet; gradients chiefly about $\frac{1}{80}$.

† This was the train last winter; it is not running now, but a slower one later in the day (7.15 p.m.).

This comparison merely illustrates the energy with which our trains are managed in England. The journey to Aberdeen does not pretend to be express, as the train is a heavy mail, which is continually picking up letters; secondly, this train stops at Perth (the mail bags go on alone to Aberdeen ahead of passengers), and there is a pause of fifty minutes before the Aberdeen portion starts; thirdly, there are two severe pieces of gradient on the way, one up to 915 feet at Shap, the other 1,015 feet north of Beattock.

Yet this mail, with the stop at Perth, casually affords a finer express run than the French train, which is a light one, has an easier route, stops 8 times and 82 minutes as against 15 times and 114 minutes, and is run as a special express at special first class fares.

This Marseilles express, though admirable for the series of very long breaks in its running, is very poor in result, compared with what, *e.g.*, the Great Northern would do if it had such an opening. There are, however, *quicker* trains in France. We give the quickest, which is also much the fastest on the Continent:—

“*First Class only.*”

Miles.		Time.		Speed.
		A.	M.	
	Bordeaux (Bastide) dep.	7	50	
21 $\frac{3}{4}$	Libourne	8	21	42
		8	23	
31 $\frac{3}{4}$	Coutras	8	39	37 $\frac{1}{2}$
		8	41	
82 $\frac{3}{4}$	Angoulême	9	50	44 $\frac{1}{2}$
		10	15	
112	Ruffec	10	56	42 $\frac{2}{3}$
		10	59	
153	Poitiers	11	55	44
		12	0	
173 $\frac{1}{4}$	Châtellerault	12	30	40 $\frac{1}{2}$
		12	32	
215 $\frac{1}{2}$	St. Pierre des Corps	1	30	43 $\frac{3}{4}$
		1	35	
248 $\frac{1}{2}$	Blois	2	20	44
		2	22	
285	Les Aubrais	3	10	45 $\frac{2}{3}$
		3	15	
324 $\frac{1}{4}$	Etampes	4	7	45 $\frac{1}{3}$
		4	10	
359	Paris	4	56	45 $\frac{1}{3}$

Journey-speed = 39 $\frac{1}{2}$.

Running-average = 43 $\frac{3}{4}$.

In the United States, from the absence of anything corresponding to our "Bradshaw," it is difficult to collect the prevalent speeds at which journeys are accomplished. But we think it is safe to say that the entire States cannot show an amount of high speed equal to that on the Great Northern alone in England. The one or two few really fine bits of running are done on the Reading line, between New York and Philadelphia, where the track is straight and nearly level.

Having disposed of the great lines, we come next to a working partner of one of them, the—

MANCHESTER, SHEFFIELD, AND LINCOLN.

This little line has two sets of expresses, both equally a credit to it, though they may not appear so in figures—

- (a.) It takes the carriages of the Great Northern Manchester and Liverpool trains along with its own from Retford to Manchester, parting at Penistone or Godley for Liverpool.
- (b.) It runs thirty-two admirable trains between Liverpool and Manchester, on the new line built by the joint committee of the Manchester, Sheffield, and Lincoln, Great Northern, and Midland Railways.

Gradients.—(a.) This is a route to breed energy. Of the $64\frac{1}{2}$ miles from Retford to Manchester, 7 only are easier than $\frac{1}{200}$; the other 56 average $\frac{1}{137}$. On such a route a journey speed of 35 would be express. From *Retford* it rises $3\frac{1}{2}$ miles averaging $\frac{1}{160}$; falls 3 more gently to *Worksop*; rises (two rests) 7 miles averaging $\frac{1}{150}$, and falls $3\frac{1}{2}$ miles averaging $\frac{1}{120}$ to *Woodhouse Junction*; rises 3 miles $\frac{1}{145}$ to *Handsworth* tunnel, and falls $2\frac{1}{2}$ miles averaging $\frac{1}{150}$ into *Sheffield*.

From *Sheffield* to *Manchester* it resembles the roof of a house; $18\frac{1}{2}$ miles of unbroken ascent averaging $\frac{1}{125}$ to the east mouth of the *Woodhead* tunnel, 1,000 feet, followed by a drop of $22\frac{1}{2}$ miles averaging $\frac{1}{115}$ (3 easy) to *Manchester*.

(b.) This line is mostly easy. Of the 18 miles between *Liverpool* and *Warrington*, 9 are $\frac{1}{200}$ or $\frac{1}{185}$, short undulations; of the 16 miles from *Warrington* to *Manchester*, 14 are practically level.

Distinct Expresses.

Miles.	Between	Number.	Average			
			Time.	Journey-Speed.	Minutes Stopped	Running-Average.
64½	Retford and Manchester....	10	H. M. 1 46½	36½	10	40 *
62½	Penistone and Liverpool ...	3 (2 up)	1 41	37	12	42
97½	Manchester and Grantham	4	2 20	41¼	5	43½†
34½ {	Liverpool and Manchester	28	— 45	45¾	2	47½†
	„	4	— 40	51½	—	51½†
	Total	49	averaging	43	and	44¾§

* Great Northern ordinary expresses.

† „ 4½ hour expresses.

‡ Thirty-two, averaging 48¼ running-average. § 2,318 miles.

Service for Chief Towns.—The service between Manchester, Liverpool, Sheffield, and London, has been already given under the Great Northern. That between *Liverpool and Manchester themselves* is by far the best local service in England. Fast trains began here, and here we find them at their best. Between these two towns we have—

Trains.

32 M. S & L., averaging 44½ minutes, with a r.a. of 48¼*

†20 L. & N.W. „ 45 „ 47¼‡

—
Total 52 expresses, with a running-average of 48
—

There are not many deaths of *ennui* in this neighbourhood. Until this summer the Midland contributed sixteen more expresses between the towns, averaging 48 running-average as well; but its trains between *Liverpool* and London now run *viâ* Stockport and Warrington; also between Warrington and Liverpool there come in the five G. Northern Liverpool expresses. Besides these there are about two dozen trains that are only slower because they make more stops; thus the North Western has 13, averaging 55¾ minutes, between Manchester and Liverpool. (There are in all four lines for the two towns, one “low level” North Western, *viâ* Warrington, and another *viâ* Wigan, in addition to the two on which expresses run.)

* The twenty-eight ¾ hour trains of the Manchester, Sheffield, and Lincoln start from each end at the half-past, from 8½ a.m. to 9½ p.m. The twenty ¾ hr. trains of the London and North Western start from each end at the hour, from 9 a.m. to 8 p.m.

† One of these runs to London Road, in 50 minutes (37¾ miles).

‡ Excluding Edge Hill tunnel, 1¼ miles, which consumes about five minutes.

Long Runs of the Manchester, Sheffield, and Lincoln.—There are 8 averaging $48\frac{3}{4}$ miles, at $43\frac{1}{2}$ running-average (the quick *Gt. Northern* trains), over a course of nothing but steep gradients. The *Longest* are between Sheffield and Grantham, $56\frac{1}{2}$ miles, in 1 hour 12 minutes = 47 running-average. *Quickest*, Manchester to Warrington, 16 miles, in 18 minutes = $53\frac{1}{3}$ running-average (done fourteen times daily).

Express Mileage.—Forty-nine expresses run 2,318 miles, at $44\frac{3}{5}$ running-average.

There are four lines left, whose express running consists almost entirely of the part they take in working the *Scotch* trains of the three great companies. These are the *North Eastern* and the *Scotch* lines, *North British*, *Caledonian*, *Glasgow & South Western*.

NORTH EASTERN.

This is a line more noted for dividends than expresses. It is a very easy line for fast running, but makes little use of its opportunities. Of ten trains which the Great Northern does its best to make "express" for Edinburgh, the North Eastern forwards four (5.15 down, 10.15, 12.40, and 7.30 up from Edinburgh) so slowly that they fail to be express on the whole journey. Thus there are six instead of ten "Scotch" expresses between Edinburgh and King's Cross. The other express trains of the North Eastern are scanty and feeble, considering the generally easy track; those to Scarborough are perhaps the most brisk, but the running-average of these is low because of a series of sharp curves beside the *Derwent* near Malton, which necessitate quiet running. Many of the towns on the North Eastern system, e.g., *Sunderland*, *Stockton*, *Middlesborough*, are badly off for express communication. This is owing to the crooked network of little parochial lines which early grew up in Durham, so that now there is great lack of straight through routes.

Gradients.—The North Eastern Railway begins at *Shaftholme*, 4 miles north of *Doncaster*, and ends at *Berwick*, 175 miles. Of these 175 miles about 100 are easier than $\frac{1}{300}$, 37 are from $\frac{1}{300}$ to

$\frac{1}{2} \frac{1}{10}$, and 37 between $\frac{1}{2} \frac{1}{10}$ and $\frac{1}{11} \frac{1}{5}$ ($\frac{1}{15} \frac{1}{0}$ and $\frac{1}{20} \frac{1}{0}$ most common). The first 70 miles, as far north as *Darlington*, are practically level. Here then is the place for speed, but except in the case of the two 9-hour Scotch trains, it is by no means the fact.

The North Eastern also works the through Scotch trains over the *North British* between Berwick and Edinburgh. The gradients here are much harder. From Berwick the line rises off and on 17 miles (9 of which in two ascents are $\frac{1}{20} \frac{1}{0}$) to near *Grant's House*, 375 feet; from this it drops $4\frac{1}{2}$ miles of $\frac{1}{9} \frac{1}{6}$ and $1\frac{1}{2}$ of $\frac{1}{21} \frac{1}{0}$ to *Innerwick*, and then proceeds with easy undulations (mostly $\frac{1}{30} \frac{1}{0}$) to *St. Margaret's*, from which it mounts $1\frac{1}{4}$ miles of $\frac{1}{7} \frac{1}{5}$ to Edinburgh.

Distinct Expresses.

Miles.	Between	Number.	Average			
			Time.	Journey-Speed.	Minutes Stopped.	Running-average.
204 $\frac{1}{2}$	York and Edinburgh { Scotch	6 (2 up)	H. M.			
147	„ Berwick... { trains	1 down	4 58 $\frac{1}{2}$	41	18	43 $\frac{3}{4}$
80 $\frac{1}{4}$ *	Newcastle and York	5 (3 up)	3 43	40	14	42 $\frac{1}{2}$ †
54	Hull and Leeds	3	2 —	40	9 $\frac{1}{2}$	43 $\frac{1}{2}$
42 $\frac{3}{4}$	York and Scarborough	4	1 18	41 $\frac{1}{2}$	5	44 $\frac{1}{3}$
			1 5 $\frac{1}{2}$	39	1 $\frac{1}{2}$	40
	Total	19	averaging	40 $\frac{1}{2}$	and	43 $\frac{1}{4}$ †

* This distance is often given as 83 $\frac{1}{4}$ miles, because until lately the Companies charged as for three additional miles as a toll for crossing the High Level bridge at Newcastle; thus Edinburgh was made to appear 395 $\frac{1}{2}$ miles from King's Cross, instead of 392 $\frac{1}{2}$.

† 9 P.M. from King's Cross, not express beyond Berwick.

‡ For 2,112 miles.

London Service of Chief Towns.

Miles.	Between London and	Number.	Average			
			Time.	Journey Speed.	Minutes Stopped.	Running-average.
			H. M.			
335	Berwick.....	6 (2 up)	8 1	41 $\frac{3}{4}$	42	45 $\frac{3}{4}$
268 $\frac{1}{4}$	Newcastle	10	6 28 $\frac{1}{2}$	41 $\frac{1}{2}$	38	46
254	Durham	8 (5 up)	6 18	40 $\frac{1}{2}$	40	45
(244 $\frac{1}{2}$	Whitby	2	6 32 $\frac{1}{2}$	37 $\frac{1}{3}$	41 $\frac{1}{2}$	41 $\frac{1}{3}$ *)
232 $\frac{1}{4}$	Darlington	11 (7 up)	5 43	40 $\frac{2}{3}$	38	45 $\frac{2}{3}$
230 $\frac{3}{4}$	Scarborough.....	8	5 42 $\frac{1}{2}$	40 $\frac{1}{3}$	40 $\frac{1}{2}$	45 $\frac{5}{6}$

* May be admitted, because of the exceptional curves and gradients between Pickering and Whitby.

Long Runs.—There are twenty, averaging 56 miles, at $44\frac{3}{5}$ running-average. *Longest*, York to Newcastle, $80\frac{1}{4}$ miles, in 1 hour 42 minutes = $47\frac{1}{5}$ running-average. *Quickest*, York to Darlington, $44\frac{1}{4}$ miles, in 53 minutes = 50 running-average (3.25 from York).

2 York and Newcastle	1 Berwick and Drem Junction
6 Newcastle and Berwick	2 York and Scarborough
6 York and Darlington	—
3 Berwick and Edinburgh	20
	—

Express Mileage.—Nineteen expresses run 2,110 miles at $43\frac{1}{4}$ running-average.

SCOTCH LINES.

There are three Scotch Companies that run expresses, and they do this over a course beset with gradients. The *Glasgow & South Western* take the Midland carriages between Glasgow and Carlisle; the *Caledonian* work the North Western trains between Glasgow, Edinburgh, Perth, and Carlisle; while the *North British* run Midland expresses between Edinburgh and Carlisle; and the Great Northern expresses worked by the North Eastern come over its main line from Berwick to Edinburgh. The North British and Caledonian have also local expresses between Edinburgh and Glasgow.

Of these three lines the express running is in each case very good, as any experience of either will attest. And though, owing to the steep ascents of unusual length, the running-average is low compared with southern lines, yet here the man who wishes to see what 70 miles an hour means can readily be satisfied, and nowhere better than here may he see how little compensatory effect a speed of 70 miles an hour *down* such a hill as $\frac{1}{7\frac{1}{5}}$ can have in making good the loss of time going *up* the other side.

The Glasgow & South Western is a much gentler route than the other two. The gradients of the former we now give—of the other two a little later.

Gradients. Glasgow and South Western.—From Carlisle the line falls gently 7 miles, rises 3 miles $\frac{1}{200}$ to *Gretna*, runs 13 miles nearly level, undulates $\frac{1}{200}$ for 5 miles, followed by 10 miles nearly level; then a long ascent with the *River Nith* for 35 miles (12 are about $\frac{1}{150}$ to $\frac{1}{200}$, the rest easy) to *New Cumnock*, 625 feet above sea. It then falls 18 miles (mostly $\frac{1}{100}$ to $\frac{1}{150}$, 3 miles nearly level) to *Kilmarnock*, 140 feet. From here the *express* route mounts

7 miles very steeply ($\frac{1}{7\frac{1}{5}}$ to $\frac{1}{150}$), falls gently 5 miles to *Caldwell*, drops steeply $4\frac{1}{2}$ miles $\frac{1}{70}$ to *Barrhead*, and falls 7 miles more gently into Glasgow, 115 miles. (The old route runs from Kilmarnock round *viâ Paisley*, nearly level, but 10 miles longer.)

Distinct Expresses of the Three Scotch Companies.

Company.	Miles.	Between	Number.	Average				Express
				Time.	Journey-Speed.	Minutes Stopped	Running-Average.	Mileage.
G. & S.W....	115 $\frac{1}{4}$	Glasgow and Carlisle	8	11. 2 46	41 $\frac{2}{3}$	7	43 $\frac{1}{2}$	Miles. 922
NORTH BRITISH	47 $\frac{1}{4}$	Glasgow and Edinburgh..	5 (3 up)	1 14	38 $\frac{1}{3}$	5	41*	—
	98 $\frac{1}{2}$	Carlisle and Edinburgh....	6	2 29	39 $\frac{1}{2}$	5	41	—
CALE- DONIAN			11	averaging	39	and	41 r.a.	825
	102	Glasgow and Carlisle	2	2 36	39 $\frac{1}{4}$	13	42 $\frac{1}{5}$	—
	101 $\frac{1}{4}$	Edinburgh and Carlisle...	7 (3 up)	2 30 $\frac{1}{2}$	40	10	43	—
	45 $\frac{3}{4}$	Edinburgh and Glasgow... (Egl. St.) <i>viâ</i> Midcalder	4	1 8 $\frac{1}{2}$	40	3	41 $\frac{1}{2}$	—
	20 $\frac{3}{4}$	Dundee and Perth	3 (1 up)	— 30	41 $\frac{1}{2}$	—	41 $\frac{1}{2}$	—
			16	averaging	40 $\frac{1}{3}$	and	42 $\frac{2}{3}$ r.a.	1,156
		Total for the three Companies	35 Exp.	averaging	40 $\frac{1}{7}$	and	42 $\frac{1}{2}$ r.a.	2,903

* These trains are only admitted as express because of the tunnel into Glasgow, which is a mile long down a gradient of $\frac{1}{40}$, and is passed over very slowly. Otherwise the line between Glasgow and Edinburgh is one of the finest bits of nearly dead level in the country. Yet the real service is very slow; there are fourteen other trains labelled "express," whose average journey-speed amounts to only $33\frac{3}{4}$ (average time 1 hour 24 minutes). The Caledonian route, *viâ* Midcalder, much harder.

Long Runs—

			Miles.	r.a.	
On the G. & S. W.	8	of	58 $\frac{1}{2}$	run at 44 $\frac{1}{3}$	All over 625 feet.
„ N. British	7	averaging	60 $\frac{1}{2}$	„ 40 $\frac{1}{3}$	{ All over 950 feet, and again over 850 for two trains.
„ Caledonian	8	„	59 $\frac{1}{2}$	„ 45 $\frac{1}{2}$	
Total ..	23	„	59 $\frac{1}{2}$	„ 43 $\frac{2}{3}$	{ Over long hills of $\frac{1}{70}$ to $\frac{1}{150}$.

Longest—

		Miles.	H.	M.	r.a.	
G. & S. W.	{ Dumfries and Kilmarnock }	58 $\frac{1}{2}$	in	1	18	= 45 { 5.15 Newspaper from St. Pancras
Caledonian	Carlisle to Carstairs	73 $\frac{1}{2}$	,,	1	35*	= 48 $\frac{1}{2}$ Limited Mail.
N. British	{ Carlisle and Edinburgh .. }	98 $\frac{1}{4}$	,,	2	20	= 42 Night Express.

Quickest—

Caledonian	Carlisle to Beattock	39 $\frac{3}{4}$	in	-	48	= 49 $\frac{2}{3}$ 10.0 from Euston
N. British	{ Polmont to Cow- lairs..... }	23 $\frac{1}{2}$	,,	-	29	= 48 $\frac{3}{5}$ { 10.0 from King's Cross.
G. & S. W.	Carlisle to Dumfries	33	,,	-	42	= 47 3 down expresses

Best Expresses.—These have already been given in the comparison of the quickest running between England and Scotland by each of the three routes (see p. 549). We now show the total express service between London and Edinburgh and Glasgow.

Total Express Service between London and Scotland.

Miles	Route.	Number.	Average				Quickest is
			Time.	Journey-Speed.	Minutes Stopped.	Running-Average.	
	<i>To and from Edinburgh</i>		H. M.				
406	{ Midland and North British }	6	10 8	40	51	45 $\frac{3}{4}$	9 hours 47 minutes = 41 $\frac{1}{2}$ journey-speed (8.0 down). [One other takes 11 hours 17 minutes = 36 (newspaper)] 9 hours = 43 $\frac{3}{5}$ journey-speed (10.0 each way). [5 others (3 up) average 10 hours 17 minutes = 38] 9 hours 50 minutes = 40 $\frac{3}{4}$ journey-speed (10.0 down). [5 others (2 up) average 10 hours 48 minutes = 37]
392 $\frac{1}{2}$	Great Northern, &c.	6 (2 up)	9 31	41 $\frac{1}{4}$	50	45 $\frac{1}{5}$	
400 $\frac{1}{4}$	{ North Western and Caledonian }	4	9 55	40 $\frac{1}{3}$	53	44 $\frac{1}{3}$	
		16 averaging		40 $\frac{1}{2}$	and	44 $\frac{2}{5}$	
	<i>To and from Glasgow</i>						
423	{ Midland and North British }	5 (3 up)	10 25	40 $\frac{3}{5}$	51	44 $\frac{1}{4}$	10 hours 20 minutes = 41 journey-speed (10.35 down). [2 others average 11 hours 28 minutes = 37] 10 hours 20 minutes = 42 $\frac{1}{2}$ journey-speed (10.0 each way). [6 others average 11 hours 50 minutes = 37] 10 hours = 40 $\frac{1}{2}$ journey-speed (10.0 each way)
439 $\frac{1}{4}$	Great Northern, &c.	3 (1 up)	10 35	41 $\frac{1}{2}$	59	45 $\frac{4}{5}$	
401 $\frac{1}{2}$	{ North Western and Caledonian }	4	10 2 $\frac{1}{2}$	40	51	43 $\frac{2}{3}$	
		12 averaging		40 $\frac{1}{2}$	and	44 $\frac{1}{2}$	

* 4 minutes' stop.

Taking Express and Fast.

Between London and	Edinburgh.	Journey-Speed.	Glasgow.	Journey-Speed.
By E. Coast route there are	6 exp. + 5 fast	11 av. $39\frac{3}{4}$	3 exp. + 6 fast	9 av. $38\frac{1}{2}$
„ W. Coast „	4 „ + 5 „	9 „ $38\frac{1}{3}$	4 „ + 5 „	9 „ $38\frac{1}{3}$
„ Midland „	6 „ + 1 „	7 „ $39\frac{1}{2}$	5 „ + 2 „	7 „ $39\frac{1}{2}$
Total	—	27 av. $39\frac{1}{3}$	—	25 av. $38\frac{2}{3}$

Speed along gradients.—Before examining those sections of line over which our finest runs occur, we may notice the importance, if we would appreciate the speed of a train, of considering the severity and length of the gradients on which the running is done. We then see why it is impossible, on most of our routes, that the alliterative popular notion of “a mile a minute” on end can be carried out, and why the actual running-average of the best express subsides to a much more modest figure.

Taking the ordinary assumption that the resistance of the rails to the motion of a load along them is uniformly about 10 lbs. per ton, or $\frac{1}{22\frac{1}{2}}$ th of the load; then—

To maintain the same speed as on level ground, an engine ascending a gradient of*

$\frac{1}{22\frac{1}{2}}$	must exert twice as much work as it need on the level
$\frac{1}{11\frac{1}{2}}$	„ 3 times „
$\frac{1}{7\frac{1}{2}}$	„ 4 „ „
$\frac{1}{5\frac{1}{2}}$	„ 5 „ „
$\frac{1}{4\frac{1}{2}}$	„ 6 „ „

(The engines of the Great Northern and Midland and other lines often exert 1,000 “horse-power” when ascending their gradients.)

But an engine made large enough to develope on occasion so great an excess over the power normally required of it on the level,

* $\frac{1}{200}$ is the most frequent gradient on the *Great Northern*; $\frac{1}{170}$, $\frac{1}{132}$, $\frac{1}{120}$ on the *Midland*, south of Leicester; $\frac{1}{132}$ to $\frac{1}{100}$ compose two-thirds of the *London, Chatham, and Dover* to Dover; $\frac{1}{120}$ to $\frac{1}{130}$ most of the *South Eastern* between New Cross and Tonbridge; $\frac{1}{135}$ is the average of the *Manchester, Sheffield, and Lincolnshire* between Sheffield and Manchester; $\frac{1}{130}$ on the *North Western*, south of Warrington; $\frac{1}{120}$ to $\frac{1}{115}$ commonest north of Preston; $\frac{1}{100}$ in long pulls between Settle and Carlisle; $\frac{1}{70}$ to $\frac{1}{120}$ plentiful on the *North British* between Carlisle and Edinburgh; $\frac{1}{80}$ to $\frac{1}{60}$ on the *Caledonian*, north of Lockerbie; $\frac{1}{100}$ to $\frac{1}{50}$ on the *Great Northern* between Wakefield and Bradford; $\frac{1}{40}$ on the *Great Western* west of Exeter; and 2 miles of $\frac{1}{37}$ on the *Midland* at Bromsgrove.

would be so heavy (leaving considerations of expense) that the permanent way would suffer from its momentum when descending. Therefore engines of the ordinary proportions, coming to a steep gradient, or to one which is not very steep but is very long (in which case the water supply shrinks), will not be able to keep on generating power enough to maintain their speed as fast as on the level. They must then submit to ascend at a speed which will not demand per second more work than the engine, coaxed to the limit of its extra-normal capacity, can supply. And if the gradient be very steep, the speed may be very low which will yet demand so much work as to reach this limit.

Now the *diminution* of speed thus produced throughout the *ascent* (and this itself, by deadening the draught, still further prevents the maintenance of pace) consumes many more minutes than could possibly be recovered, even by a *corresponding acceleration*, while descending the other side. For suppose that an engine able to draw its usual load 60 miles an hour on the level comes to an ascent of 10 miles of $\frac{1}{100}$, followed by a similar descent. Suppose speed falls to (an average of) 30 miles going up, and that going down the train runs (an average of) 90 miles an hour:—

Going *up* each mile occupies 2 minutes, therefore the 10-mile ascent takes 20 minutes.

Going *down* each mile occupies two-thirds of a minute, therefore the 10-mile descent takes $6\frac{2}{3}$ minutes. $26\frac{2}{3}$ minutes altogether up and down.

i.e., the whole 20 miles take $6\frac{2}{3}$ minutes more than they would have done on the level, a loss of $\frac{1}{3}$ *more* time. But now in actual practice the loss is greater again than this. For however slowly the gradient may cause the train to ascend, when it comes to descend the other side it must not as a rule be allowed to run faster than about 70 miles an hour. Curves, permanent way, wear and tear of carriages, and other considerations, forbid it.

And, therefore, as the favourable side of a gradient can never raise speed much above, while the unfavourable side may reduce it very much below, 60 miles an hour, we see why “a mile a minute” standard is too high for a country like England, and why the net effect of gradients is mostly dead loss uncompensated, especially for expresses whose ordinary speed on the level comes near to 60 miles an hour.

It is true that were rails frictionless, and stopping stations on the tops of watersheds, the extra momentum gained going down-hill might help in the next *ascent* so that the average pace need not be much less than over an equal distance on the level. But in practice, first, there is friction, which soon nips off the superadded speed; and, secondly, most of our important towns are on rivers or otherwise near sea level, placed as it were on either side of a roof

near the bottom. Thus the train tackles the ascent in the most unfavourable circumstances, and has to pull up again when the conditions are most in its favour.

Those lines then whose routes are comparatively level should exhibit better running-averages than the others, especially when trains are heavy. And when we see the "running-average" of *Midland* trains over Derbyshire and Westmoreland heights (long pulls up $\frac{1}{90}$ and $\frac{1}{100}$), of the *Caledonian* or *North British* over Lowland watersheds ($\frac{1}{80}$ and $\frac{1}{70}$), or of *Manchester, Sheffield, & Lincolnshire* up and down the Pennine ($\frac{1}{125}$), we must admire, not so much the dashing descent, as the persistent strength with which those engines mount.

We will now describe the gradients of those portions of the three great lines and their Scotch connections which we have not yet given, viz., the hilly sections, and at the same time notice the best runs made over these hill sections.

The runs are these:—*

Between	Miles.	Time Taken.	Running Average.	Done by
Grantham and King's Cross (G.N.R.)	10 $\frac{1}{2}$	H. M.		
St. Pancras and Leicester (Midland).....	99 $\frac{1}{4}$	2 7	51	2 up fast exp. from Manchester
Carlisle and Edinburgh (N. British)....	98 $\frac{1}{4}$	2 20	47	Down Scotch express
Derby and Liverpool (Midland)	91 $\frac{1}{2}$	2 4	42	Night expresses—in summer
Skipton and Carlisle („)	86 $\frac{3}{4}$	1 55	44 $\frac{1}{4}$	12.0 from St. Pancras
Carlisle and Carstairs (Caledonian)	73 $\frac{1}{2}$	1 35	45 $\frac{1}{5}$	Night express—summer
Carlisle and Carnforth (N. Western) ..	62 $\frac{3}{4}$	1 25	48 $\frac{1}{2}$	Lim. mail { It stops 4' at summit for water
Bedford and Kentish Town (Midland)	48	1 —	44 $\frac{1}{4}$	Limited mail
			48	All the Manchester expresses

A. From King's Cross the line rises $1\frac{1}{2}$ miles at $\frac{1}{110}$ to Holloway, runs 3 nearly level to Hornsey, then rises 8 miles of $\frac{1}{200}$ to *Potter's Bar*, about 350 feet above sea; falls 4 miles gently and 2 at $\frac{1}{200}$ to a little past Hatfield; rises 5, $3\frac{1}{2}$ of which are $\frac{1}{200}$, to *Knebworth*, 360 feet; falls gently 4 miles to Stevenage, and then down 7 miles of $\frac{1}{200}$ to *Arlesey* ($35\frac{1}{2}$ miles from London). From here it runs 24 miles nearly level (with the Ouse) to *Huntingdon*; then rises 3 miles $\frac{1}{200}$ before *Abbot's Ripton*, and falls again 5 miles $\frac{1}{200}$ on to the Fens (67 miles from London). Then follow 24 miles nearly level to 2 miles beyond *Essendine*; and from this it rises 9 miles

* *The Longest Run outside England is in France.*

Roche to Dijon (P., L., and Med.)	99	2 41	37	7.15 p.m. from Paris. 1st cl. only
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(1 mile rest) of $\frac{1}{200}$ and $\frac{1}{178}$ to *Stoke* tunnel (lias-oolite), 370 feet above sea; then falls 5 miles of $\frac{1}{200}$ to *Grantham*, 105 $\frac{1}{2}$ miles.

[Thus the long run of the up Manchester express is over a course by no means quite easy, having two adverse spells of $\frac{1}{200}$ for 5 and 7 miles respectively. The slack through Peterborough and after Finsbury Park must also be considered. The corresponding *down* trains take two minutes longer, as the adverse spells are then 8 and 8 (with a rest) of $\frac{1}{200}$.]

The rest of the course from *Grantham* to *Doncaster* is nearly level, dropping down gently to Newark (120 miles), with a short rise and fall (3 miles $\frac{1}{200}$) on each side of the Askham tunnel near Retford.

Between *Doncaster* and *Leeds* there are two steep bits, a 7-mile rise and 4-mile fall (chiefly $\frac{1}{150}$) before *Wakefield*, and a 5-mile rise after to the *Ardley* summit (385 feet), from which the line falls 4 miles $\frac{1}{100}$ to *Leeds* (185 $\frac{1}{2}$ miles). From *Ardley* the Bradford trains continue with a steep rise for 8 miles ($\frac{1}{70}$ to $\frac{1}{132}$) to about 750 feet, then drop very steeply 4 miles (2 of $\frac{1}{50}$ to $\frac{1}{60}$) into *Bradford* (192 $\frac{1}{2}$ miles). Thus the speed to Bradford is very good. In 1880 it was better, as four trains ran between Bradford and London in four hours. [And on 24th June, 1832, H.R.H. the Prince of Wales came from Bradford to London in 3 hours 48 minutes, including a stop of 5 minutes at Grantham. This was a journey-speed of 50 $\frac{1}{2}$, and a running-average of 52. This is perhaps better than the more level trip made by the Lord Mayor and suite on 31st July, 1880, when the run to York from King's Cross was done in 3 hours 37 minutes, including 10 minutes' stop at Grantham, a journey-speed of 52, and running-average of 54 $\frac{1}{2}$.]

B. *St. Pancras* to *Leicester*:—

From *St. Pancras* the line rises (with 1 $\frac{1}{2}$ mile rest) 12 $\frac{1}{2}$ miles moderately steep (5 of $\frac{1}{176}$) to *Elstree*; falls 2 $\frac{1}{2}$ of $\frac{1}{200}$, rises 5 miles (past *St. Albans*) of $\frac{1}{176}$, then runs about level for 11 miles (past *Luton*) to 430 feet above sea (34 miles from London); from which it falls 16 miles, 11 of which are $\frac{1}{200}$, into *Bedford*. From *Bedford* it rises gently 6 miles and 4 miles steep ($\frac{1}{120}$) to *Sharnbrook* summit; drops 3 miles of $\frac{1}{120}$ and 1 of $\frac{1}{200}$ to *Wellingborough*; rises gently for 7 miles to *Kettering*; then rises steeply 6 $\frac{1}{2}$ miles, $\frac{1}{132}$ or $\frac{1}{165}$, to *Desborough* summit, 490 feet; drops again 4 miles of $\frac{1}{132}$ to *Market Harborough*; rises 5 miles gently and 2 of $\frac{1}{132}$ to *Kibworth* summit (420 feet); and falls 9 miles gradually into *Leicester*, 99 $\frac{1}{4}$ miles.

This, though the elevations are not very great, is a very trying long run, the second half being much harder than the first. The running average of 47 attained over these steep ups and downs by the Scotch express with its heavy train is a first rate performance.

b. So too are the every day runs of the Liverpool and Manchester

expresses, which regularly stop at Kentish Town platform one hour after leaving Bedford, 48 miles, with a long pull of 11 miles $\frac{1}{200}$ up (2 miles rest). The 5.15 a.m. newspaper train runs easily in the hour from *St. Pancras* to Bedford, $49\frac{3}{4}$ miles, and then does the $49\frac{1}{2}$ miles to Leicester in the next hour. These are the sort of things that do not happen out of England.

C. *Carlisle to Edinburgh*, by "Waverley" route:—

The North British on leaving Carlisle fluctuates for 11 miles with moderate steepness without rising, then rises 8 miles, 4 of which are $\frac{1}{100}$, and falls again 2 miles to *Kershope Foot*, from which it rises 4 miles moderately ($\frac{1}{200}$ to $\frac{1}{300}$) to a mile past *Newcastleton*, 315 feet. Here it mounts up very steeply $9\frac{1}{2}$ miles, 8 of which are $\frac{1}{75}$, to the summit a mile and a half beyond *Ricarton Junction* (955 feet, 34 miles from Carlisle). From this it drops 11 miles, mostly $\frac{1}{75}$ to $\frac{1}{100}$, down to *Hawick* on the Teviot, along the left bank of which it rises 6 miles, and falls 6 rather steeply ($\frac{1}{120}$ to $\frac{1}{200}$) to *St. Boswell's*, then fluctuates easily for $6\frac{1}{2}$ miles to *Galashiels* on the Tweed (315 feet, $64\frac{1}{2}$ miles from Carlisle). Here it runs up beside the *Gala Water* rather steeply for 16 miles (mostly $\frac{1}{150}$ and $\frac{1}{120}$) to the summit near *Falahill* (850 feet, 80 miles from Carlisle), from which it drops 15 miles, 8 of which are $\frac{1}{70}$, to *Portobello Junction*, rises a mile and a half easy, and mounts $1\frac{1}{4}$ of $\frac{1}{78}$ into Edinburgh, $98\frac{1}{4}$ miles.

This is undoubtedly the hardest of all the routes in the kingdom along which any train runs at express speed. Twice to climb such gradients and yet keep on for 98 miles without a halt, is a feat of Homeric nature, and a testimonial to English engineers.

D. *Derby to Liverpool*, *viâ* Stockport:—

The Midland runs beside the Derwent for about 20 miles from Derby, rising gently (steepest $\frac{1}{330}$) to *Ambergate*, 9 miles, and a little more to *Rowsley*. Here it leaves the Derwent, and winds up for 12 miles in a series of curves along the valley of the Wye, ascending more steeply as it proceeds. Soon after *Miller's Dale* ($31\frac{1}{2}$ miles) it leaves the Wye and mounts up 6 miles about $\frac{1}{90}$ to the *Peak Forest* tunnel, 999 feet above sea ($37\frac{1}{2}$ miles) from which it drops 10 miles very steeply (about $\frac{1}{90}$) to *Marple*, $48\frac{3}{4}$ miles. From Marple it falls again steeply to *Stockport* ($53\frac{3}{4}$ miles). From Stockport to *Warrington* is $19\frac{3}{4}$ miles nearly level, and from Warrington 18 miles of short fluctuations ($\frac{1}{200}$) or level bring it to *Liverpool*, $91\frac{1}{2}$ miles.

This long run (which is contingent on signals at Stockport and Warrington) is the result of the improvement lately made in the Liverpool trains of the North Western, which now runs three (two down) in $4\frac{1}{2}$ hours. Since this the Midland send their Liverpool carriages on *viâ* Stockport instead of Manchester, and some are run

as distinct trains from Derby. The quickest Midland train runs from Liverpool in 5 hours 5 minutes; 27 miles and 35 minutes longer than the North Western, but a much finer performance.

E. *Skipton to Carlisle.* (Midland):—

The line rises 8 miles of $\frac{1}{150}$, and falls 5 averaging $\frac{1}{200}$ to 2 miles south of *Settle*, about 390 feet above sea. From here it mounts up 15 miles of $\frac{1}{100}$ to *Blea Moor* tunnel, 1,130 feet ($1\frac{1}{2}$ miles long). It then undulates nearly level for 10 miles (over five viaducts and through three tunnels) to *Ais Gill* sidings, 1,170 feet above sea. From this it drops 15 miles, 11 of which are $\frac{1}{100}$, to *Ormside*, and runs 3 miles nearly level to *Appleby*, 540 feet; then falls 2 miles $\frac{1}{120}$ and 13 gently to *Lazonby*; undulates 7 miles about same height, and falls 7 miles of $\frac{1}{132}$ (1 mile level) into *Carlisle*, $86\frac{3}{4}$ miles, about 70 feet above sea.

There are two things equally fine about this run, the view from the top of the watershed, and the style in which the express engine ascends. The day express, the heaviest, reaches the tunnel 22 minutes after passing *Settle*, $13\frac{3}{4}$ miles, an average speed of $37\frac{1}{2}$ miles per hour. It therefore makes each second a vertical step of $6\frac{1}{2}$ inches and a forward movement of 55 feet.

F. *Carlisle and Carstairs.* (Caledonian):—

The line falls gently $7\frac{1}{2}$ miles to nearly sea level, rises 7 about $\frac{1}{200}$, falls 4 gently, rises 4 of about $\frac{1}{200}$ past *Ecclefechan*, falls 7 gently (past *Lockerbie*), and rises 7 gently to the thirty-sixth mile from *Carlisle*. It then rises 4 miles of $\frac{1}{200}$, and mounts up steeply $9\frac{1}{2}$ of about $\frac{1}{80}$ to the summit, 1,015 feet above sea, from which it falls moderately fluctuating for 22 miles to *Carstairs*, 640 feet, $73\frac{1}{2}$ miles. The ascent is made beside *Eyan Water*, a branch of the *Annan*, and the descent follows the *Clyde*. (To *Glasgow* the line continues with the *Clyde* in a steep descent (chiefly $\frac{1}{100}$), while to *Edinburgh* it turns east, rises again to 870 feet, and falls steeply ($\frac{1}{100}$) to the capital.)

The runs of several expresses over this watershed are extremely creditable, particularly that of the down mail, which, as shown in the table, averages a speed of $48\frac{1}{2}$ on the $73\frac{1}{2}$ miles between *Carlisle* and *Carstairs*. The last 10 miles before the summit can hardly take less than 20 minutes ($\frac{1}{80}$), and this leaves only 71 minutes for the remaining $63\frac{1}{2}$ miles, an average speed of $53\frac{2}{3}$ miles an hour, which is a feat of good driving on such a course.

G. *Carlisle to Carnforth*:—

Starting from about 70 feet above sea, the North Western rises 5 miles averaging $\frac{1}{132}$ and 7 averaging $\frac{1}{200}$, then runs nearly level (past *Penrith*) for 9 miles; here it mounts up $7\frac{1}{2}$ miles of $\frac{1}{125}$ and 2 of $\frac{1}{100}$ to *Shap* summit, 915 feet above sea ($30\frac{1}{2}$ miles from *Carlisle*). From this it drops very steeply (and sharp curves)

4 miles of $\frac{1}{75}$ and 2 of $\frac{1}{177}$ to *Tebay*, from which it rises again a little 5 miles to *Grayrigg*, 600 feet; from here it drops 13 miles averaging $\frac{1}{20}$ and $2\frac{1}{2}$ of $\frac{1}{31}$ to *Carnforth*, only a few feet above sea level. [From *Carnforth* to *Euston* (except a mile at *Lancaster* and a little between *Preston* and *Wigan*) the track is very easy, the worst gradients (except 3 miles $\frac{1}{177}$ into *Crewe* from *Shap*) being $\frac{1}{330}$].

This North Western route is easier than the Midland for *down* trains, but rather harder for the *up*; as though the gradients in the latter case are not quite so steep, yet the North Western climbs 850 feet from *Carlisle* to *Shap* in 31 miles, as against 1,100 feet from *Carlisle* to *Ais Gill* in 46 miles. The curves are also sharper than in the case of the Midland, which was built regardless of expense. But allowing for this, the speed of the Midland remains a better performance.

On any of the seven hill sections above described, a man who wishes to experience "70 miles an hour" can be satisfied every day. At two points in particular, when he drops like a star from *Peak Forest* into the smoke of *Manchester*, or when the lonely "*Maiden Paps*" disappear behind him as he swoops down the curves of *Slitrig Water* into *Hawick*, he will not feel easy till he learns that good continuous brakes are waiting charged beneath his feet.

We can now sum up the results for the whole kingdom:—

I.—NUMBER AND MILEAGE OF EXPRESSES RUN BY EACH COMPANY.

Extent of System in Miles.		Distinct Expresses.	Average Journey-speed.	Running-average.	Express Mileage.
1,773	North Western	$\left\{ \begin{smallmatrix} 54 \\ 28 \end{smallmatrix} \right\} 82$	$40\frac{2}{3}$	$43\frac{7}{10}$	10,400
1,260	Midland	66	$41\frac{2}{3}$	45	8,860
928	Great Northern	$\left\{ \begin{smallmatrix} 48 \\ 19 \end{smallmatrix} \right\} 67$	43	$46\frac{1}{2}$	6,780
907	Great Eastern	34	41	$43\frac{1}{4}$	3,040
2,267	Great Western	18	42	$46\frac{1}{4}$	2,600
1,519	North Eastern	19	$40\frac{1}{2}$	$43\frac{1}{4}$	2,110
290	Manch., Sheff., and Line.	49	43	$44\frac{3}{5}$	2,318
767	Caledonian	16	$40\frac{1}{5}$	$42\frac{3}{4}$	1,155
$435\frac{1}{2}$	Brighton	13	41	$41\frac{2}{3}$	1,155*
382	South Eastern	12	41	$41\frac{2}{3}$	940
329	Glasgow and S. Western	8	$41\frac{2}{3}$	$43\frac{1}{2}$	920
$796\frac{1}{2}$	London and S. Western	3	$41\frac{1}{10}$	$44\frac{1}{3}$	890†
984	North British	11	39	41	830
153	Chatham and Dover ...	9	42	$43\frac{1}{3}$	690
		407	$41\frac{2}{3}$	$44\frac{1}{3}$	42,680

* The running-average of *expresses* is $41\frac{2}{3}$, but is $41\frac{1}{2}$ for the 1,155 mileage, which includes Long runs of some fast trains.

† The running-average of the *expresses* is $44\frac{1}{3}$, but is 44 for the 890 mileage, which includes Long runs of some fast trains.

A total of four hundred and seven express trains, whose average journey-speed is $41\frac{2}{3}$, and which run 42,680 miles at an average "running-average" of $44\frac{1}{3}$ miles per hour.

If we arrange the Companies according to their *speed* instead of their *mileage*, the order is:—

II.—EXPRESS MILEAGE ARRANGED ACCORDING TO SPEED.

	Average r.a.	Miles.		Average r.a.	Miles.
Great Northern	$46\frac{1}{2}$	6,780	Great Eastern	$43\frac{1}{4}$	3,040
Great Western	$46\frac{1}{4}$	2,600*	North Eastern	$43\frac{1}{2}$	2,110
Midland	45	8,860	Chatham and Dover	$43\frac{1}{4}$	690
Man., Shef., and Lin.	$44\frac{3}{5}$	2,318	Caledonian	$42\frac{3}{4}$	1,155
Lond. and S. Western	44	890	South Eastern	$41\frac{3}{4}$	940
North Western	$43\frac{7}{10}$	10,400	Brighton	$41\frac{1}{2}$	1,155
Glas. and S. Western	$43\frac{1}{2}$	920	North British	41	825

* Not reckoning mileage west of *Exeter*.

Express Routes arranged in Order of Difficulty of Gradients, &c.

North British	Chatham and Dover	Brighton
Caledonian	South Eastern	North Western
Man., Sheff., and Lin.	Great Northern	North Eastern
Midland	South Western	Great Western
Glas. and S. Western	Great Eastern	

Note.—This order is only approximate, reckoning besides *gradients* such adverse conditions as the number of enforced *slackenings* past junctions, &c., or the time lost in London *suburbs*, &c.

III.—LONG RUNS IN ENGLAND.

On the Midland.....	104,	averaging 53 m. at an av. r.a. of	$46\frac{1}{2}$ (5,512 m.)
„ North Western....	98,	„ 60 „ „	45 (5,880 „)
„ Great Northern....	49,	„ $73\frac{3}{4}$ „ „	50 (3,616 „)
„ Great Western	24,	„ 56 „ „	$48\frac{1}{2}$ (1,344 „)
„ Great Eastern	24,	„ $56\frac{3}{4}$ „ „	$42\frac{1}{2}$ (1,362 „)
„ Brighton	23,	„ $45\frac{1}{2}$ „ „	42 (1,047 „)
„ North Eastern	20,	„ 56 „ „	$44\frac{3}{4}$ (1,120 „)
„ South Western....	13,	„ $47\frac{1}{2}$ „ „	$44\frac{3}{8}$ (615 „)
„ South Eastern	12,	„ $66\frac{1}{4}$ „ „	$42\frac{1}{3}$ (795 „)
„ Chatham & Dover	8,	„ 63 „ „	45 (504 „)
„ Caledonian	8,	„ $59\frac{1}{2}$ „ „	$45\frac{1}{2}$ (476 „)
„ Glasgow and S. } Western	8,	„ $58\frac{1}{2}$ „ „	$44\frac{1}{3}$ (468 „)
„ Man., Shef. & L.	8,	„ $48\frac{3}{4}$ „ „	$43\frac{1}{2}$ (390 „)
„ North British	7,	„ $60\frac{1}{2}$ „ „	$40\frac{1}{3}$ (423 „)
Total	406,	averaging 58 miles at a r.a. of	$45\frac{3}{4}$ (23,550 m.)

Note.—From this it will be seen that the three great companies run 61 per cent. of the whole *express mileage*, and 62 per cent. of the whole number of *long runs*.

Long Runs arranged According to Speed.

This would be very similar to the order in Table II, except that the long runs of the Manchester, Sheffield and Lincoln occur on its steepest section, and hence this line would come near the bottom.

IV.—FASTEST RUNS IN ENGLAND.

On the	Between	Distance.	Time.	Running Average.	Done by
		Miles.	H. M.		
<i>Tan. Sheff. and Linc.</i>	Manchester & Warrington	16	— 18	= 53 $\frac{1}{3}$	18 trains daily
<i>Great Western</i>	Paddington and Swindon	77 $\frac{1}{2}$	1 27	= 53 $\frac{1}{3}$	4 Exeter expresses
<i>Great Northern</i>	Grantham and Doncaster	50 $\frac{1}{2}$	— 58	= 52 $\frac{1}{4}$	1.15 from King's Cross
"	" London ...	105 $\frac{1}{2}$	2 4	= 51	2 Manchester exp. up
<i>North Western</i>	Northampton & Willesden	60 $\frac{1}{4}$	1 10	= 51 $\frac{2}{3}$	9.30 from Birmingham
"	Rugby "	77 $\frac{1}{4}$	1 32	= 50 $\frac{1}{3}$	7.30
<i>Midland</i>	Liverpool and Stockport ...	37 $\frac{3}{4}$	— 45	= 50 $\frac{1}{3}$	{ With or " without a stop; 4 trains
"	St. Pancras and Kettering	72 $\frac{1}{4}$	1 27	= 49 $\frac{1}{3}$	10.0 from London
"	Bedford and Kentish Town	48	1 —	= 48	All Manch. expresses
<i>North Eastern</i>	York and Darlington	44 $\frac{1}{4}$	— 53	= 50	3.25 from York
<i>Caledonian</i>	Carlisle and Beattock	39 $\frac{1}{2}$	— 48	= 49 $\frac{2}{3}$	10.0 from Euston
"	" Carstairs	73 $\frac{1}{2}$	1 31	= 48 $\frac{1}{2}$	8.50 "
<i>Great Eastern</i>	Lincoln and Spalding	38 $\frac{1}{4}$	— 47	= 48 $\frac{1}{6}$	3 or 4 trains
<i>North British</i>	{ Polmont and Cowlares (between Edinburgh and Glasgow)	23 $\frac{1}{2}$	— 29	= 48 $\frac{2}{3}$	10.0 from King's Cross
<i>Glas. and S. Western</i>	Carlisle and Dumfries	33	— 42	= 47	10.35 from St. Pancras
<i>Brighton</i>	London Bridge & Brighton	50 $\frac{1}{2}$	1 5	= 46 $\frac{2}{3}$	5.0 down
<i>South Eastern</i>	Herne Hill and Dover	74	1 36	= 46 $\frac{1}{4}$	7.40 A.M. from Victoria
<i>South Western</i>	{ Yeovil Junction and Exeter (ticket)	48 $\frac{1}{2}$	1 3	= 46 $\frac{1}{3}$	3 down trains
" <i>Eastern</i>	Cannon Street and Dover	74 $\frac{1}{2}$	1 39	= 45	7.40 A.M. from Cannon St.

V.—FASTEST RUNS OVER STEEP GROUND (*arranged in Order of Severity of Route*).

Between	Distance.	Time.	Running Average.	Company.
	Miles.	H. M.		
Carlisle and Edinburgh	98 $\frac{1}{4}$	2 20	= 42	North British
" Carstairs	73 $\frac{1}{2}$	1 31	= 48 $\frac{1}{2}$	Caledonian
" Carnforth	62 $\frac{3}{4}$	1 25	= 44 $\frac{1}{4}$	North Western
" Skipton	86 $\frac{3}{4}$	1 55	= 45 $\frac{1}{3}$	Midland
Derby and Liverpool	91 $\frac{1}{2}$	2 4	= 44 $\frac{1}{4}$	"
St. Pancras and Leicester ...	99 $\frac{1}{4}$	2 7	= 47	"

Mileage of Long Runs over Steep Ground.

	Runs.	Averaging	Running-Average.
In the Scotch <i>Lowlands</i> , by the three Companies	23	59½ miles	43⅔
„ <i>Derbyshire and Westmoreland</i> , by Midland	16	66 „	44
„ <i>Lake District</i> , by North Western	12	60¾ „	43
Across the <i>Pennine</i> , by Manchester, Shef., and Linc.	4	41 „	40⅓
Total hill runs	55	60⅓ miles	43½*

* Over 3,318 miles.

Note.—This table does perhaps more credit to English railways than either of the others.

VI.—LONGEST RUNS IN ENGLAND.

	Miles.	Company.	Run in	Running-Average.
			H. M.	
1. Grantham and King's Cross	105½	Great Northern	2 4	= 51
2. Leicester and St. Pancras	99¼	Midland	2 7	= 47
3. Carlisle and Edinburgh.....	98¼	North British	2 20	= 42
4. Nuneaton and Willesden ..	91½	Lond. & N. Wstn.	1 57	= 47
5. Derby and Liverpool	91½	Midland	2 4	= 44½
6. Preston and Carlisle	90	Lond. & N. Wstn.	2 10	= 41½
7. Skipton „	86¾	Midland	1 55	= 45½
8. Chester and Holyhead	84½	Lond. & N. Wstn.	2 -	= 42½
9. Rugby and Euston.....	82¾	„	1 50	= 45
10. Grantham and York	82½	Great Northern	1 39	= 50
11. Newcastle „	80¼	North Eastern	1 42	= 47½
12. Victoria and Dover	78	L. C. and Dover	1 45	= 44¾
13. Paddington and Swindon	77⅞	Great Western	1 27	= 53½
14. Cannon Street and Dover ...	74½	South Eastern	1 39	= 45
15. Carlisle and Carstairs.....	73½	Caledonian	1 31	= 48½

VII.—TOWNS BEST SUPPLIED WITH EXPRESSES TO AND FROM LONDON.

Distance.	Between	In Summer.
Miles.		
82 $\frac{3}{4}$, 84 $\frac{3}{4}$	<i>Rugby</i> and London there are 50 express journeys daily	
182 $\frac{1}{2}$ —203	<i>Manchester</i>	42 "
105 $\frac{1}{2}$	<i>Grantham</i>	37 " (19 up)
177—200	<i>Stockport</i>	35 " (17 ")
124—127 $\frac{3}{4}$	<i>Nottingham</i> ..	35 " (17 ")
158, 160	<i>Crewe</i>	34 " (16 ")
158—164	<i>Sheffield</i>	33 " (17 ")
76 $\frac{1}{4}$	<i>Peterborough</i> ..	29 " (16 ")
185 $\frac{1}{2}$ —204	<i>Leeds</i>	28 " "
193 $\frac{1}{2}$ —237 $\frac{1}{2}$	<i>Liverpool</i>	27 " (14 ")
156	<i>Doncaster</i>	27 " (12 ")
182 $\frac{1}{4}$ —219 $\frac{1}{2}$	<i>Warrington</i> ..	27 " (13 ")
55 $\frac{1}{2}$ —58	<i>Cambridge</i>	24 " "
138 $\frac{1}{2}$	<i>Relford</i>	23 " (11 up)
192 $\frac{1}{2}$ —193 $\frac{1}{2}$	<i>Bradford</i>	22 " "
128 $\frac{3}{4}$, 138 $\frac{1}{2}$	<i>Derby</i>	21 " (10 up)
65 $\frac{3}{4}$	<i>Northampton</i> ..	21 " (9 ")
188	<i>York</i>	20 " (9 ")
99 $\frac{1}{4}$	<i>Leicester</i>	20 " "
49 $\frac{1}{4}$	<i>Bedford</i>	17 " (9 ")
392 $\frac{1}{2}$ —406	<i>Edinburgh</i>	16 " (7 ")
299 $\frac{1}{4}$ —310	<i>Carlisle</i>	14 " "
77	<i>Swindon</i>	13 " (6 ")
51 $\frac{3}{4}$	<i>Colchester</i>	13 " (5 ")
47 $\frac{3}{4}$	<i>Basingstoke</i> ..	13 " (6 ")
401 $\frac{1}{2}$ —439 $\frac{3}{4}$	<i>Glasgow</i>	12 " "
113—129	<i>Birmingham</i> ..	12 " "
130 $\frac{1}{4}$ —143 $\frac{1}{2}$	<i>Lincoln</i>	12 " "
232	<i>Darlington</i>	11 " "
179—213	<i>Chester</i>	11 " "
268 $\frac{1}{4}$	<i>Newcastle</i>	10 " "
118 $\frac{1}{2}$	<i>Bristol</i>	10 " "

N.B.—The express service to and from *London* is generally identical with the *entire* express service between towns; the only separate *local* expresses are between Manchester and Liverpool; between Bristol, Birmingham, Derby, York, Leeds, and Hull; between Newcastle and York; and Leeds and York.

VIII.—IMPORTANT TOWNS BADLY OFF FOR EXPRESS COMMUNICATION.

	Number.	Population.	
Portsmouth.....	<i>none</i>	127,000	} Most rapidly growing ports in England
Southampton	"	60,000	
Swansea	"	65,000	
Cardiff	1	85,000	
Yarmouth	<i>none</i>	46,000	} Port for Ireland and possibly America
Norwich	1	87,000	
Milford Haven	<i>none</i>	—	
Falmouth	"	—	
Hull	3	—	Fourth port in kingdom
Weymouth	<i>none</i>	14,000	Port for G. Western route to France
Sunderland	1	120,000	Port
Middlesborough....	3	60,000	120 blast furnaces, &c.

IX.—QUICKEST TIME TO IMPORTANT TOWNS FROM LONDON (*during Summer*).

Miles.		Up or Down	Time.		Journey- Speed.	Minutes Stopped.	Running- Average.	Number of Stoppages.	Company.
			H.	M.					
540 ¹	Aberdeen	d.	14	50	36 ² ₃	114	41 ⁴ ₅	16	N. Western and Calm.
277 ¹	Appleby	"	6	46	41	40	45 ¹ ₂	4	Midland
47 ³	Basingstoke	"	1	3	45 ¹ ₂	—	45 ¹ ₂	—	Lon. and S. Western
106 ¹	Bath	"	2	13	48	10	52	1	Great Western
49 ³	Bedford	"	1	—	49 ³ ₄	—	49 ³ ₄	—	Midland
335	Berwick	"	7	38	43 ² ₅	42	48 ¹ ₃	3	G.N. and N.E.
228 ¹	Birkenhead	"	5	8	44 ¹ ₂	16	47	5	Great Western
{ 113	Birmingham	up	2	35	43 ¹ ₂	9	46 ¹ ₂	4	Lon. and N. Western
{ 129 ¹	"	d.	2	42	47 ¹ ₂	4	49	1	Great Western
{ 115	Bournemouth	"	3	9	36 ² ₃	15	<i>not exp.</i>	6	Lon. and S. Western
{ 193	Bradford	up	4	15	45 ² ₅	17	48 ² ₅	6	Great Northern
{ 209 ¹	"	"	4	55	42 ² ₅	23	46	5	Midland
{ 50 ¹	Brighton	d.	1	5	46 ² ₅	—	46 ² ₅	—	L.B. and S.C.
{ 118 ¹	Bristol	both	2	36	45 ¹ ₂	13	49 ¹ ₂	2	Great Western
{ 163	Buxton	up	4	5	40	28	44 ¹ ₂	6	Midland
{ 55 ¹	Cambridge	d.	1	15	44 ² ₅	—	44 ² ₅	—	Great Eastern
{ 58	"	up	1	15*	46 ² ₅	3	48 ¹ ₃	2	" Northern
{ 68	Canterbury	"	1	38	41 ¹ ₂	2	42 ¹ ₂	1	South Eastern
{ 61 ³	"	d.	1	23	44 ² ₅	2	45 ¹ ₄	1	Lon. Chat. and Dove
{ 170 ¹	Cardiff	"	4	21	39 ¹ ₂	25	43 ¹ ₂	5	{ Great Western (th only express)
{ 299 ¹	Carlisle	up	7	15	41 ¹ ₂	41	45 ¹ ₂	5	Lon. and N. Western
{ 307 ¹	"	d.	7	20	42	31	45 ¹ ₂	7	Midland
{ 34	Chatham	both	—	50	40 ¹ ₂	2	42 ¹ ₂	1	Lon. Chat. and Dove
{ 122 ¹	Cheltenham	d.	3	15	37 ¹ ₂	24	<i>not exp.</i>	4	Great Western
{ 179	Chester	up	4	10	43	21	47	3	Lon. and N. Western
{ 213	"	d.	4	50	44	15	46 ² ₃	5	Great Western
{ 152 ¹	Chesterfield	"	3	18	46	10	49 ² ₅	2	Midland
{ 51 ¹	Colchester	"	1	10	44 ¹ ₂	—	44 ¹ ₂	—	Great Eastern
{ 94	Coventry	up	2	4	45 ¹ ₂	6	47 ¹ ₂	2	Lon. and N. Western
{ 158	Crewe	"	3	30	45	11	47 ² ₅	2	"
{ 232 ¹	Darlington	"	5	19	43 ² ₅	36	49 ¹ ₂	2	Great Northern
{ 128 ¹	Derby	both	2	53	44 ² ₅	14	48 ¹ ₂	3	Midland
{ 156	Doncaster	d.	3	13	48 ¹ ₂	7	50 ¹ ₂	2	Great Northern
{ 74 ¹	Dover	"	1	39	45	—	45	—	South Eastern
{ 78	"	up	1	45	44 ² ₅	—	44 ² ₅	—	Lon. Chat. and Dove
{ 350	Dublin	d.	11	30	28 ² ₅	in cluding land and sea		8	Lon. and N. Western
{ 474 ¹	Dundee	"	12	10	38 ¹ ₂	70	<i>not exp.</i>	14	"
{ 254	Durham	up	5	59	42 ¹ ₂	42	48	8	G.N. and N.E.
{ 65 ¹	Eastbourne	d.	1	35	41 ¹ ₂	1	41 ⁴ ₂	1	L.B. & S.C.
{ 392 ¹	Edinburgh	both	9	—	43 ² ₅	49	48	4—5	East Coast Route
{ 400 ¹	"	d.	9	50	40 ¹ ₂	51	44 ² ₅	8	West " "
{ 476	"	"	9	47	41 ¹ ₂	55	44 ¹ ₂	9	Midland "
{ 70 ¹	Ely	"	1	38	43	2	44	1	Great Eastern
{ 171 ¹	Exeter	"	4	3	42 ¹ ₂	15	45	5	Lon. and S. Western
{ 194	"	"	4	14	45 ¹ ₂	23	50 ¹ ₂	4	Great Western

* 12.0 up express. This train runs half a mile more than the quick "Scotchman" between Edinburgh and Berwick in the same time. The gradients are of about equal difficulty in either case, but the Cambridge train has to slacken at *Shelford Junction*, and makes two stops, ascending gradients, one at *Royston*, the other *Hitchin*.

X *Contd.*—QUICKEST TIME TO IMPORTANT TOWNS FROM LONDON
(during Summer).

files.		Up or Down.	Time.		Journey- Speed.	Minutes Stopped.	Running- Average.	Number of Stoppages.	Comp. by.
			H.	M.					
312 $\frac{1}{4}$	Falmouth	up	8	30	36 $\frac{3}{4}$	52	<i>not exp.</i>	16	Great Western
69	Folkestone	both	1	45	39 $\frac{1}{2}$	—	39 $\frac{1}{2}$	—	South Eastern
401 $\frac{1}{2}$	Glasgow	both	10	—	40 $\frac{1}{2}$	51	44	8	West Coast
423	"	d.	10	20	41	56	45	8	Midland
439 $\frac{1}{2}$	"	both	10	20	42 $\frac{1}{2}$	59	47	9	East Coast
105 $\frac{1}{2}$	Grantham	up	2	4	51	—	51	—	Great Northern
114	Gloucester	d.	2	53	39 $\frac{1}{2}$	14	43	3	" Western
199 $\frac{1}{2}$	Halifax	"	4	45	42	25	46	10	" Northern
69 $\frac{1}{4}$	Harwich	"	1	46	39 $\frac{1}{2}$	—	39 $\frac{1}{2}$	—	" Eastern
60 $\frac{1}{2}$	Hastings	up	1	37	37 $\frac{3}{4}$	3	<i>not exp.</i>	2	South Eastern
263 $\frac{1}{2}$	Holyhead	d.	6	35	40	31	43 $\frac{1}{2}$	7	L. and N.W.
188 $\frac{1}{2}$	Huddersfield	both	4	35	41	33	46 $\frac{3}{4}$	6	G.N. and M.S. & L.
197	Hull	d.	4	50	40 $\frac{1}{2}$	32	45 $\frac{3}{4}$	8	G.N. and N.E.
226	Ilfracombe	"	6	20	35 $\frac{1}{4}$	40	<i>not exp.</i>	14	South Western
594 $\frac{1}{2}$	Inverness	"	16	40	35 $\frac{3}{4}$	120	<i>not exp.</i>	25	N.W. & Highland
68 $\frac{1}{2}$	Ipswich	both	1	40	41 $\frac{1}{4}$	—	41 $\frac{1}{4}$	14	Great Eastern
230 $\frac{1}{4}$	Lancaster	d.	5	40	40 $\frac{3}{4}$	39	46	4	L. and N.W.
126	Leamington	"	2	13	47 $\frac{3}{4}$	4	49 $\frac{1}{4}$	1	Great Western
185 $\frac{1}{2}$	Leeds	up	4	—	46 $\frac{3}{4}$	12	48 $\frac{3}{4}$	5	" Northern
196	"	both	4	30	43 $\frac{1}{2}$	14	46	3	Midland, <i>via</i> Trent
204	"	d.	4	39	45 $\frac{1}{2}$	16	48	3	" <i>via</i> Melton
99 $\frac{1}{4}$	Leicester	"	2	7	47	—	47	—	Midland
130 $\frac{1}{4}$	Lincoln	"	3	5	42 $\frac{1}{4}$	23	48 $\frac{1}{4}$	4	Great Northern
143 $\frac{1}{2}$	"	"	3	23	42 $\frac{3}{4}$	9	44 $\frac{3}{4}$	—	" Eastern
193 $\frac{1}{2}$	Liverpool	"	4	30	43	20	46 $\frac{3}{4}$	5	L. and N.W.
220 $\frac{1}{4}$	"	up	5	5	43 $\frac{1}{2}$	24	47	7	Midland
229	"	d.	5	25	see <i>Birkenhead</i>	Corrailway	portion	7	Great Western
237 $\frac{1}{2}$	"	"	5	55	40	33	44 $\frac{1}{2}$	10	G.N. and M.S. & L.
170	Macclesfield	"	4	5	41 $\frac{3}{4}$	16	44 $\frac{1}{2}$	5	North Western
189	Manchester	both	4	30	42	24	46	6	"
191 $\frac{1}{4}$	"	up	4	35	41 $\frac{3}{4}$	21	45 $\frac{3}{4}$	6	Midland
203	"	both	4	30	45	10	47	—	G.N. and M.S. & L.
73 $\frac{3}{4}$	Margate	both	1	45	42	4	45 $\frac{4}{5}$	2	Chatham and Dover
238 $\frac{1}{2}$	Middlesbrough	d.	5	44	41 $\frac{3}{4}$	24	44 $\frac{1}{4}$	7	G.N. and N.E.
28 $\frac{1}{2}$	Milford Haven	up	8	—	35 $\frac{3}{4}$	62	<i>not exp.</i>	12	Great Western
120	Newark	d.	2	36	46	7	48 $\frac{1}{2}$	3	" Northern
265 $\frac{1}{4}$	Newcastle	"	6	7	44	37	48 $\frac{3}{4}$	2	G.N. and N.E.
158 $\frac{1}{2}$	Newport (Mon.)	"	4	—	39 $\frac{3}{4}$	22	43 $\frac{3}{4}$	4	Great Western
62 $\frac{3}{4}$	Northampton	"	1	22	45	—	48	—	L. and N.Western
124	Norwich	"	3	10	39	14	42 $\frac{1}{4}$	3	Great Eastern
127 $\frac{1}{4}$	Nottingham	"	2	48	45 $\frac{3}{4}$	7	47 $\frac{3}{4}$	4	" Northern
124	"	"	2	35	45	4	49 $\frac{1}{4}$	1	Midland
63 $\frac{1}{4}$	Oxford	"	1	18	49	—	49	—	Great Western
326 $\frac{1}{2}$	Penzance	up	8	55	36 $\frac{1}{2}$	55	<i>not exp.</i>	18	"
450 $\frac{1}{2}$	Perth	d.	11	25	39 $\frac{1}{2}$	56	43	13	N. Western and Caln.
462	"	up	11	30	40	75	45	14	East Coast Route
477 $\frac{1}{2}$	"	d.	12	23	38 $\frac{1}{2}$	72	42 $\frac{3}{4}$	13	Midland
76 $\frac{1}{4}$	Peterborough	"	1	30	50 $\frac{1}{5}$	—	50 $\frac{1}{5}$	—	Great Northern
246 $\frac{1}{2}$	Plymouth	"	6	—	41	35	45 $\frac{1}{2}$	9	" Western
73 $\frac{1}{2}$	Portsmouth	up	1	55	38 $\frac{1}{2}$	8	<i>not exp.</i>	4	L. and S. Western
209 $\frac{1}{4}$	Preston	"	4	50	45 $\frac{1}{4}$	19	46 $\frac{1}{2}$	3	L. and N. Western
49 $\frac{1}{2}$	Queenborough	d.	1	25	35	6	<i>not exp.</i>	2	L. and N. Western

IX *Contd.*—QUICKEST TIME TO IMPORTANT TOWNS FROM LONDON
(during Summer).

Miles.		Up or Down	Time.	Journey- Speed.	Minutes Stopped.	Running- Average.	Number of Stoppages.	Company.
			H. M.					
{ 79	Ramsgate	both	2 —	39½	8	42½	4	Lon.Chat.and Dover
{ 83¾	" from } up		2 6	40	6	42	3	South Eastern
	London Bridge }							
35½	Reading	d.	— 46	46½	—	46½	—	Great Western
138½	Retford	up	2 54	47¾	6	49½	2	" Northern
82½	Rugby	"	1 45	47½	2	48	1	Lon. and N.Western
83½	Salisbury	d.	1 56	43	5	45	2	Lon. and S.Western
230½	Scarborough	"	5 35	41½	42	47¼	5	G.N. and N.E.
{ 164½	Sheffield	"	3 35	46	11	48½	2	Midland
162	" "	"	3 23	48	5	49	1	Great Northern
{ 163	Shrewsbury	"	3 48	43	18	46¾	4	Lon. and N.Western
171	" "	"	3 47	45¼	10	47¾	3	Great Western
223	Skipton	"	5 22	41½	29	45½	6	Mid. (via Sheffield)
264	Snowdon*	"	8 50	30	80	35	20	Lon. and N.Western
79	Southampton	"	2 4	38½	10	not exp.	4	Lon. and S.Western
133½	Stafford	"	3 —	44½	8	46½	2	"
{ 184	Stockport	"	4 19	42½	20	46	6	Lon. and N.Western
182½	" "	up	4 18	42½	18	45¾	5	Midland
{ 199¾	" "	d.	4 59	40	29	44¾	7	G.N. and M.S. & L.
666	Strome Ferry	"	20 50	32	180	37½	37	{ L. and N.W., Caln. and Highland
216	Swansea	"	6 —	36	40	not exp.	9	Great Western
77	Swindon	both	1 27	53½	—	53½	—	"
220	Torquay	d.	5 12	42½	35	47¾	7	"
175	Wakfield	up	3 40	47¾	9	49¾	3	Great Northern
{ 182½	Warrington	"	4 25	41½	22	45	5	Lon. and N.Western
202	" "	"	4 42	43	23	46½	6	Midland
{ 219½	" "	d.	5 28	40	31	44½	9	G.N. and M.S. & L.
168	Weymouth	up	4 20	38¾	38	not exp.	7	Great Western
{ 244½	Whithy	d.	6 25	38	36	42	11	G.N. and N.E.
755¾	Wick	"	23 10	32½	180	not exp.	47	{ L. and N.W., Caln. and Highland
194	Wigan	"	4 34	42½	18	45½	4	Lon. and N.Western
141	Wolverhampton ..	"	3 4	46	7	48	2	Great Western
120	Worcester	"	2 58	40½	18	45	4	G.W. (via Oxford)
121½	Yarmouth	up	3 21	36¼	16	not exp.	4	G.E. (via Colchester
124½	Yeovil	d.	3 1	41	12	44	5	Lon. and S.Western
188	York	both	3 55	48	6	49¼	1	Great Northern

* Rhyl-ddu, 2½ miles from summit.

These are the statistics of English expresses for the year 1883. In this list there is no mention of the scores of rapid trains which swarm between *Manchester* and the towns within 15 miles of it, of those between *Glasgow* and *Paisley*, between *Derby* or *Nottingham* and *Chesterfield*, between *Birmingham*, *Wolverhampton*, and *Stafford*, between *Leeds* or *Skipton* and *Bradford*, between *London* and *Croydon*, or in the neighbourhood of other busy centres. These distances are too small and the routes too crowded to give room for real express speed.

A few lines may be added to the above figures.

First, they represent the programme of the various Companies *on paper*. This programme is so good that it should be an object of each man's pride to carry it out every day in practice. But some lines do this better than others, generally those that set themselves the hardest task.

Secondly, it is true that these figures would be more interesting if we had a history of them for several decades past, so that we might see the record of growth. In the meantime we may say roughly, that during the last 10 years the *mileage* of our express trains has increased about 25 per cent., and their average *speed* about $2\frac{1}{2}$ miles an hour, while the *weight* of the trains has increased from 30 to 50 per cent. in many cases. (Third class passengers came into expresses generally about 1873.) This has taken place during a long-drawn depression of trade, and is perhaps one of the *sequels* of that depression (cheap materials.) It brings out however the pleasant fact that industrial dulness has not demoralized the excellence of workmanship in those industries essential to a railway.

Lastly, even apart from a retrospective comparison, the interest of these figures is obvious. The mileage and speed of express trains in England is so much greater than in the rest of the world, that any reflection on the fact must send a glow of satisfaction through every Englishman. For what is implied by this superior speed? We quote from the address by Mr. Percy Westmacott to the Institute of Mechanical Engineers at their meeting in Belgium last July, an address entitled "High Speed and High Workmanship:"—

"Mechanical energy increases as the square of the speed; and so it may be said that the mental energy and skill required to carry on work increases also at something like the square of the speed with which that work is performed. The materials used must be far stronger and far finer; everything must be well proportioned and balanced; there must be the most perfect arrangement in each structure and in every part of a structure; . . . and thus we may say . . . 'The higher the speed, the better the work.'"

In fact:—

"If 'twere well that it were done, 'twere well it were done quickly."

for, to quote again from the speech above, "Rapidity of working brings out and perfects the highest qualities of the engineer." And not only of the engineer, but equally of every man concerned in the working of the line, when railways are in question. There would be many fewer accidents on our lines if the speed on some of them were higher, or if there were *more* of the highest speed.

A low standard of attainment breeds a slack discipline, but when a company tries every day to run as well as it possibly can, there must be and is a devotion to detail all along the line.

As to the subtler, but not less valuable, social effects which result from quick transit, they are becoming too apparent now to require pointing out. We may simply conclude with the answer of Mr. Frederick Barry before the Lords' Committee on the London and Birmingham Railway Bill (1832), that, as locomotion is a means to an end, "I take it as common sense that *the greater the expedition, the more benefit will be derived by all parties*, where certainty is to be had." For quick certainty of attainment, alike in the case of railways, justice, or anything else, is what makes the world throb with vigour.

Note.—The writer wishes here to express his thanks for the courtesy of the various Railway Companies who have kindly supplied him with information, and answered questions on many points of detail.

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JOURNAL OF THE STATISTICAL SOCIETY,

DECEMBER, 1883.

*The PROGRESS of the WORKING CLASSES in the LAST HALF CENTURY:
being the INAUGURAL ADDRESS of R. GIFFEN, LL.D., President
of the Statistical Society, SESSION 1883-84. Delivered 20th
November, 1883.*

IN assembling for the labours of another session, our first duty, as it was a year ago, is to commemorate the heavy loss which the Society has sustained by death. On the last occasion the names before us were those of Mr. Newmarch and Mr. Jevons, identified for many years with our work, and intimately known to many of us. On the present occasion the loss to be recorded is of another co-worker equally distinguished, though in a different way, and perhaps possessing a more exclusively statistical reputation—Dr. Farr. The *Journal* of the Society already contains a record of our sense of loss, but a few words more may surely be permitted here—in memory of one who was present year after year, not only at our inaugural meetings, but at almost all the ordinary meetings as well: who, throughout a long career, contributed numerous and valuable papers to our discussions, the interval between his first and last paper read at our meetings being over thirty years; who in the fulness of time, and certainly not before he deserved the distinction, presided over us for the usual period; and who, in fact, deserves credit as one of the makers and promoters of this Society, and of the study which we cultivate, in the most literal sense of the words. It is a very great loss we have sustained. Happily in Dr. Farr's case we have not to lament the premature shortening of days which we had to lament in referring to the loss of Mr. Newmarch and Mr. Jevons. Dr. Farr had reached the limit of a tolerably long life, and till within a very few years of the close, had been able to take an active part in the studies to which he was devoted. There are at least two remarkable monuments of his later labours, the special report to the registrar-general on the mortality of the 1861-71 decade, which was completed only seven or eight years ago, and his paper on the mode of estimating the value of stocks having a deferred dividend, read at one of our meetings in King's College in the year 1876, after Dr. Farr had served his term as president of the Society. We can

only lament Dr. Farr's loss, therefore, as the common lot of humanity, and though we could have wished a longer life and greater service, we may rejoice that the life was not incomplete, and that Dr. Farr had time to perfect his best work. What he has left is a noble monument of industry and ingenuity, full of example to all of us who have devoted time and strength to statistics, and he is certain to be honoured, we may be sure, by future generations even more than he has been by the present. To have organised, as he did, the official records of vital statistics on a model which has been widely followed not only here but abroad, and which has done much even already to promote the health and welfare of mankind, by revealing and making evident to all some main causes of disease and mortality, is a great work for one man to have done. Politicians and members of parliament, who are ready enough to use whatever figures come to hand as implements of political warfare, but who seldom study them, may not have been able to recognise the work as the public did, but the work remains, and we, at any rate, as members of the Statistical Society, are all proud of it.

I am sorry to have to add that after this address was prepared, the announcement appeared in the newspapers of the death of Lord Overstone, who was also one of the founders of this Society, and one of its most active promoters in its earlier years, and who was President in the years 1851-53. Lord Overstone has long survived the limit of the active period of life, and as we have been reminded within the last day or two, the public have very largely forgotten the services which he rendered; but in this Society there is enough knowledge and enough interest in the economic pursuits to which Lord Overstone devoted himself, for many of us here really to possess some acquaintance with what he accomplished. There can be no doubt that in the evidence which he gave before several Committees of the House of Commons, and in the opinions which he expressed privately to cabinet ministers and public men on economic and more especially financial matters, upon which he was frequently consulted, Lord Overstone was able to render eminent services to the country. As a preacher of the doctrine of "hard money" he did much to settle the basis of the national currency in a difficult time, and that in a way which has left no room for change, and which has thus done not a little to steady the business of the country. There is no doubt also that it was in his capacity as statistician very largely that he was able to render these services. He was preeminently one of those men who were extremely practical and careful about the facts upon which they gave their opinions. We may thus claim Lord Overstone as one of our distinguished members. I may add that of the

original members of the Society there are now very few surviving. We have others surviving, as I shall notice presently, who were members almost from the beginning, but I am speaking now literally of our formal beginning. Amongst those who will be known to you, I think, Mr. Heywood and Mr. Edwin Chadwick are to be mentioned as among the very distinguished members who were at the foundation of the Society, and who still survive to take an interest in our labours.

The mention of the names of Lord Overstone and Dr. Farr carries us back naturally enough to the origin of the Society. We are carried back to the same date by an impending event which now casts its shadow before—our approaching jubilee, which we may hope will be worthily celebrated. It is of good augury, I trust, that we commence our fiftieth session with the election of no fewer than fifty-eight new members. It seems fairly probable now that when we complete our fiftieth year we shall have the round number of one thousand members—a wonderful improvement upon the small number of fifty years ago. On such an occasion I believe the subject on which I propose to address you to-night will be not unsuitable—a review of the official statistics bearing on the progress of the working classes—the masses of the nation—in the last half century. If you go back to the early records of the Society, you will find that one of the leading objects of its founders was to obtain means by which to study the very question I have selected. Happily we have still with us, in addition to those I have named as original members, one or two honoured members associated with the early history of the Society—Dr. Guy and Sir Rawson Rawson—who will bear me out in what I have stated. I may remind you, moreover, that one of the founders of the Society was Mr. Porter, of the Board of Trade, whose special study for years was much the same, as his well-known book, “The Progress of the Nation,” bears witness; and that in one of the earliest publications of the Society, a volume preceding the regular issue of the *Journal*, he has left a most interesting account of what he hoped might be effected by means of statistics in studying the subject I have put before you, or the more general subject of the “Progress of the Nation.” In asking you, therefore, to look for a little at what statistics tell us of the progress of the great masses of the nation, I feel that I am selecting a subject which is connected with the special history of the Society. That it happens for the moment to be attracting a considerable amount of popular attention in connection with sensational politics and sociology, with agitations for land nationalisation and collectivism among pretended representatives of the working classes, is an additional reason for our

not neglecting this question; but it is a question to which the Society has a primary claim, and which the authors of the agitations I have referred to would have done well to study from the statistical point of view.

There are two or three ways in which statistics may throw light on such a question as I have put forward. The first and most direct is to see what records there are of the money earnings of the masses now and fifty years ago, ascertain whether they have increased or diminished, and then compare them with the rise or fall in the prices of the chief articles which the masses consume. Even such records would not give a complete answer. It is conceivable, for instance, that while earning more money, and being able to spend it to more advantage, the working classes might be no better off than formerly. There may be masses, as there are individuals, who do not know how to spend. The question of means, however, will carry us some distance on the road to our object. We shall know that the masses must be better off, unless they have deteriorated in the art of spending, a subject of separate inquiry.

In investigating such records, however, we have to recognise that the ideal mode of answering the question is not yet possible. That mode would be to draw up an account of the aggregate annual earnings of the working classes for a period about fifty years ago, and a similar account of the aggregate annual earnings of the same classes at the present time, and then compare the average per head and per family at the different dates. Having thus ascertained the increase or diminution in the amount per head at the different dates, it would be comparatively easy, though not in itself quite so easy a matter as it seems, to ascertain how much less or how much more the increased or diminished sum would buy of the chief articles of the workman's consumption. But no such account that I know of has been drawn up, except for a date about fifteen or sixteen years ago, when Mr. Dudley Baxter and Professor Leone Levi both drew up statements of enormous value as to aggregate earnings, statements which it would now be most desirable to compare with similar statements for the present time, if we could have them, and which will be simply invaluable to future generations. In the absence of such statements, all that can be done is to compare what appear to be the average wages of large groups of the working classes. If it is found that the changes in the money wages of such groups are in the same direction, or almost all in the same direction, then there would be sufficient reason for believing that similar changes had occurred throughout the entire mass. It would be in the highest degree improbable that precisely those changes which could not be traced were in the

opposite direction. The difficulty in the way is that in a period of fifty years in a country like England the character of the work itself changes. The people who have the same names at different times are not necessarily doing the same work. Some forms of work pass wholly away and wholly new forms come into existence. Making all allowances, however, and selecting the best comparative cases possible, some useful conclusion seems obtainable.

What I propose to do first and mainly, as regards this point, is to make use of an independent official record which we have to thank Mr. Porter for commencing. I mean the record of wages, which has been maintained for many years in the Miscellaneous Statistics of the United Kingdom, and which was previously commenced and carried on in the volumes of Revenue and Population Tables which Mr. Porter introduced at the Board of Trade about fifty years ago. It is curious on looking back through these volumes to find how difficult it is to get a continuous record. The wages in one volume are for certain districts and trades; in a subsequent volume, for different districts and trades; the descriptive classifications of the workers are also constantly changing. Picking my way through the figures, however, I have to submit the following particulars of changes in money wages between a period forty to fifty years ago—it is not possible to get the same year in all cases to start from—and a period about two years ago, which may be taken as the present time. This comparison leaves out of account the length of hours of work, which is a material point I shall notice presently.

Comparison of Wages Fifty Years ago and at Present Time.

[From "Miscellaneous Statistics of the United Kingdom," and Porter's "Progress of the Nation."]

Occupation.	Place.	Wages Fifty Years ago, per Week.	Wages Present Time, per Week.	Increase or Decrease, Amount per Cent.
Carpenters	Manchester	24/-	34/-	10/- (+) 42
"	Glasgow	14/-	26/-	12/- (+) 85
Bricklayers	Manchester*	24/-	36/-	12/- (+) 50
"	Glasgow	15/-	27/-	12/- (+) 80
Masons	Manchester*	24/-	29 10	5 10 (+) 24
"	Glasgow	14/-	23 8	9 8 (+) 69
Miners	Staffordshire	2 8†	4/-†	1 4 (+) 50
Pattern weavers	Huddersfield	16/-	25/-	9/- (+) 55
Wool scourers	"	17/-	22/-	5/- (+) 30
Mule spinners	"	25 6	30/-	4 6 (+) 20
Weavers	"	12/-	26/-	14/- (+) 115
Warpers and beamers ..	"	17/-	27/-	10/- (+) 58
Winders and reelers	"	6/-	11/-	5/- (+) 83
Weavers (men)	Bradford	8 3	20 6	12 3 (+) 150
Reeling and warping	"	7 9	15 6	7 9 (+) 100
Spinning (children)	"	4 5	11 6	7 1 (+) 160

* 1825.

† Wages per day.

Thus in all cases where I have found it possible from the apparent similarity of the work to make a comparison there is an enormous apparent rise in money wages ranging from 20 and in most cases from 50 to 100 per cent., and in one or two instances more than 100 per cent.* This understates, I believe, the real extent of the change. Thus, builders' wages are given at the earlier date as so much weekly, whereas in the later returns a distinction is made between summer and winter wages, the hours of labour being less in winter, and as the wages are so much per hour, the week's wages being also less, so that it has been possible to strike a mean for the later period, while it does not appear that anything more is meant at the early period than the usual weekly wage, which would be the summer wage. Without making this point, however, it is obvious that in all cases there is a very great rise.

Before passing from this point there is another and continuous official record I would refer to. Unfortunately it does not go back for much more than thirty years. Still, as far as it goes, the evidence is in the same direction. I refer to the return of merchant seamen's wages annually issued by the Board of Trade, in what is known as the Progress of Merchant Shipping Return. From this return may be derived the following comparison of seamen's wages:—

Comparison of Seamen's Money Wages per Month at 1850 and the Present Time.

[From the "Progress of Merchant Shipping Return."]

	1850, Sailing.	Present Time, Steam.	Increase.	
			Amount.	Per Cent.
Bristol.....	45/-	75/-	30/-	66
Glasgow	45/-	70/-	25/-	55
Liverpool (1)	50/-	67/6	16/6	33
" (2)	50/-	85/-	35/-	70
" (3)	45/-	60/-	15/-	33
" (4)	40/-	50/-	10/-	25
" (5)	42/6	60/-	17/6	40
London (1).....	45/-	75/-	30/-	66
" (2).....	50/-	77/6	27/6	55
" (3).....	45/-	65/-	20/-	45
" (4).....	45/-	70/-	25/-	55
" (5).....	40/-	67/6	27/6	69
" (6).....	40/-	67/6	27/6	69

Here again there is an enormous rise in money wages. This return is specially subject to the observation that money wages are

* The mean of the percentages of increase is over 70.

only part of the wages of seamen, but I assume it is not open to dispute, that with the improvement in our shipping there has been an improvement in the food and lodging of the sailor, quite equal to the improvement in his money wage.

This question of seamen's wages, however, well illustrates the difficulty of the whole subject. Ships are not now navigated by able seamen so much as by engineers and stokers. It would seem that as a class the new men all round are paid better than the able seamen, but I should not press this point; it might well be the case that steam ships as a whole could be worked by an inferior class of labourers as compared with sailing ships, and yet the fact that inferior labour is sufficient for this special trade would be quite consistent with the fact that the whole conditions of modern labour require more skill than the conditions fifty years ago, so that there is more labour relatively at the higher rates than used to be the case.

The comparison, except for seamen's wages, where it has only been possible to go back for about thirty years, is made between a period about fifty years ago and the present time only. It would have complicated the figures too much to introduce intermediate dates. I may state, however, that I have not been inattentive to this point, and that if we had commenced about twenty to twenty-five years ago, we should also have been able to show a very great improvement since that time, while at that date also, as compared with an earlier period, a great improvement would have been apparent. A careful and exhaustive investigation of the records of wages I have referred to, in comparison with the numbers employed in different occupations, as shown by the census reports, would in fact repay the student who has time to make it; and I trust the investigation will yet be made.

The records do not include anything relating to the agricultural labourer, but from independent sources—I would refer especially to the reports of the recent Royal Agricultural Commission—we may perceive how universal the rise in the wages of agricultural labourers has been, and how universal at any rate is the complaint that more money is paid for less work. Sir James Caird, in his "*Landed Interest*," (p. 65), puts the rise at 60 per cent. as compared with the period just before the repeal of the corn laws, and there is much other evidence to the same effect. The rise in the remuneration of labour in Ireland in the last forty years is also one of the facts which has been conspicuously brought before the public of late. In no other way is it possible to account for the stationariness of rents in Ireland for a long period, notwithstanding the great rise in the prices of the cattle and dairy products which Ireland produces, and which, it has been contended, would have

justified a rise of rents. The farmer and the labourer together have in fact had all the benefit of the rise in agricultural prices.

The next point to which attention must be drawn is the shortening of the hours of labour which has taken place. While the money wages have increased as we have seen, the hours of labour have diminished. It is difficult to estimate what the extent of this diminution has been, but collecting one or two scattered notices I should be inclined to say very nearly 20 per cent. There has been at least this reduction in the textile, engineering, and house-building trades. The workman gets from 50 to 100 per cent. more money, for 20 per cent. less work; in round figures, he has gained from 70 to 120 per cent. in fifty years in money return. It is just possible of course that the workman may do as much or nearly as much in the shorter period as he did in his longer hours. Still there is the positive gain in his being less time at his task, which many of the classes still tugging lengthily day by day at the oar would appreciate. The workman may have been wise or unwise in setting much store by shorter hours in bettering himself, but the shortening of the hours of labour is undoubtedly to be counted to the good as well as the larger money return he obtains.

We come then to the question of what the changes have been in the prices of the chief articles of the workman's consumption. It is important, to begin with, that as regards prices of commodities generally, there seems to be little doubt things are much the same as they were forty or fifty years ago. This is the general effect of the inquiries which have been made first as to the depreciation of gold consequent on the Australian and Californian gold discoveries, and next as to the appreciation of gold which has taken place within the last twenty years, consequent on the new demands for gold which have arisen, and the falling off in the supply as compared with the period between 1850 and 1860. It would burden us too much to go into these inquiries on an occasion like the present, and therefore I only take the broad result. This is that while there was a moderate rise of prices all round between the years 1847-50, just before the new gold came on the market, and the year 1862, when Mr. Jevons published his celebrated essay, a rise not exceeding about 20 per cent., yet within the last twenty years this rise has disappeared, and prices are back to the level, or nearly to the level, of 1847-50. The conclusion is that, taking things in the mass, the sovereign goes as far as it did forty or fifty years ago, while there are many new things in existence at a low price which could not then have been bought at all. If, in the interval, the average money earnings of the working classes

have risen between 50 and 100 per cent., there must have been an enormous change for the better in the means of the working man, unless by some wonderful accident it has happened that his special articles have changed in a different way from the general run of prices.

But looking to special articles, we find that on balance prices are lower and not higher. Take wheat. It is notorious that wheat, the staff of life, has been lower on the average of late years than it was before the free trade era. Even our fair trade friends, who find it so difficult to see very plain things, were forced to allow, in that wonderful manifesto which was published in the "Times" some weeks back, that wheat is about 5s. a quarter cheaper on the average than it was. The facts, however, deserve still more careful statement to enable us to realise the state of things fifty years ago and at the present time. The fair trade statement, if I remember rightly, showed an average fall of 5s. in the price of wheat, comparing the whole period since the repeal of the Corn Laws with a long period before. This may have been right or wrong for the purpose in hand, but for our present purpose, which is to compare the present period with that of half a century ago, it is important to note that it is mainly within the last ten years the steadily low price of wheat has been established. Comparing the ten years before 1846 with the last ten years, what we find is that while the average price of wheat in 1837-46 was 58s. 7d., it was 48s. 9d. only in the last ten years—a reduction not of 5s. merely, but 10s. The truth is, the repeal of the Corn Laws was not followed by an *immediate* decline of wheat on the average. The failure of the potato crop, the Crimean War, and the depreciation of gold, all contributed to maintain the price, notwithstanding free trade, down to 1862. Since then steadily lower prices have ruled; and when we compare the present time with half a century ago, or any earlier part of the century, these facts should be remembered.

There is a still more important consideration. Averages are very good for certain purposes, but we all know in this place that a good deal sometimes turns upon the composition of the average,—upon whether it is made up of great extremes, or whether the individual elements depart very little from the average. This is specially an important matter in a question of the price of food. The average of a necessary of life over a long period of years may be moderate, but if in some years the actual price is double what it is in other years, the fact of the average will in no way save from starvation at certain periods the workman who may have a difficulty in making both ends meet in the best of times. What we find then is that fifty years ago the extremes were disastrous compared with

what they are at the present time. In 1836 we find wheat touching 36*s.*; in 1838, 1839, 1840, and 1841, we find it touching 78*s.* 4*d.*, 81*s.* 6*d.*, 72*s.* 10*d.*, and 76*s.* 1*d.*; in all cases double the price of the lowest year, and nearly double the "average" of the decade; and in 1847 the price of 102*s.* 5*d.*, or three times the price of the lowest period, is touched. If we go back earlier we find still more startling extremes. We have such figures as 106*s.* 5*d.* in 1810; 126*s.* 6*d.* in 1812; 109*s.* 9*d.* in 1813, and 96*s.* 11*d.* in 1817; these figures being not merely the extremes touched, but the actual averages for the whole year. No doubt in the early part of the century the over-issue of inconvertible paper accounts for part of the nominal prices, but it accounts for a very small part. What we have to consider then is, that fifty years ago the working man with wages, on the average, about half, or not much more than half, what they are now, had at times to contend with a fluctuation in the price of bread which implied sheer starvation. Periodic starvation was, in fact, the condition of the masses of working men throughout the kingdom fifty years ago, and the references to the subject in the economic literature of the time are most instructive. M. Quetelet, in his well-known great book, points to the obvious connection between the high price of bread following the bad harvest of 1816, and the excessive rate of mortality which followed. To this day you will find tables in the registrar-general's returns which descend from a time when a distinct connection between these high prices of bread and excessive rates of mortality was traced. But within the last twenty years what do we find? Wheat has not been, on the average, for a whole year so high as 70*s.*, the highest averages for any year being 64*s.* 5*d.* in 1867, and 63*s.* 9*d.* in 1868; while the highest average of the last ten years alone is 58*s.* 8*d.* in 1873; that is only about 10*s.* above the average of the whole period. In the twenty years, moreover, the highest price touched at any period was just over 70*s.*, viz., 70*s.* 5*d.*, in 1867, and 74*s.* 7*d.* in 1868; while in the last ten years the figure of 70*s.* was not even touched, the nearest approach to it being 68*s.* 9*d.* in 1877. Thus of late years there has been a steadily low price, which must have been an immense boon to the masses, and especially to the poorest. The rise of money wages has been such, I believe, that working men, for the most part, could have contended with extreme fluctuations in the price of bread better than they did fifty years ago. But they have not had the fluctuations to contend with.

It would be useless to go through other articles with the same detail. Wheat had quite a special importance fifty years ago, and the fact that it no longer has the same importance—that we have ceased to think of it as people did fifty years ago—is itself

significant. Still, taking one or two other articles, we find, on the whole, a decline :—

Prices of Various Articles about Fifty Years ago and at Present Time.

	1839-40.		Present Time.	
	s.	d.	s.	d.
Sugar per cwt.	68	8*	21	9†
Cotton cloth exported per yard	—	5 $\frac{3}{4}$	—	3 $\frac{1}{4}$
	(1840.)		(1882.)	
Inferior beasts per 8 lbs.	3	1	4	3 $\frac{3}{4}$
Second class "	3	6	4	9 $\frac{3}{4}$
Third „ "	3	11 $\frac{3}{4}$	5	7 $\frac{1}{2}$
Inferior sheep "	3	5	5	7
Second class "	3	10 $\frac{1}{4}$	6	1 $\frac{1}{4}$
Large hogs "	4	3 $\frac{1}{2}$	4	6

* Porter's "Progress of the Nation," p. 543. In the paper as read to the Society I gave the price without the duty, but including the duty the price was what is now given here. The average price with the duty of the ten years ending 1840 was 58s. 4d.

† Average price of raw sugar imported.

I should have liked a longer list of articles, but the difficulty of comparison is very serious. It may be stated broadly, however, that while sugar and such articles have declined largely in price, and while clothing is also cheaper, the only article interesting the workman much which has increased in price is meat, the increase here being considerable. The "only" it may be supposed covers a great deal. The truth is, however, that meat fifty years ago was not an article of the workman's diet as it has since become. He had little more concern with its price than with the price of diamonds. The kind of meat which was mainly accessible to the workman fifty years ago, viz., bacon, has not, it will be seen, increased sensibly in price.

Only one question remains. Various commodities, it may be admitted, have fallen in price, but house rent, it is said, has gone up. We have heard a good deal lately of the high prices of rooms in the slums. When we take things in the mass, however, we find that however much some workmen may suffer, house rent in the aggregate cannot have gone up in a way to neutralise to any serious extent the great rise in the money wages of the workman. It appears that in 1834, when the house duty, which had existed up to that date, was abolished, the annual value of dwelling houses charged to duty was 12,603,000*l.*, the duty being levied on all houses above 10*l.* rental in Great Britain. In 1881-82 the annual value of dwelling houses charged to duty, the duty being levied on houses above 20*l.*

only, was 39,845,000*l.*, while the value of the houses between 10*l.* and 20*l.* was 17,040,000*l.*, making a total of 56,885,000*l.*, or between four and five times the total of fifty years ago. Population, however, in Great Britain has increased from about 16½ millions in 1831, to nearly 30 millions in 1881, or nearly 100 per cent. Allowing for this, the increase in value would be about 32 million pounds, on a total of about 25 million pounds, which may be considered the increased rent which householders above 10*l.* have to pay—the increase being about 130 per cent. Assuming that houses under 10*l.* have increased in proportion, it may be considered that house rents are now 1½ times more than they were fifty years ago. In other words, a workman who paid 3*l.* a year fifty years ago, would now pay 7*l.* 10*s.* Even, however, if rent were a fourth part of the workman's earnings fifty years ago, he would still be much better off at the present time than he was. His whole wages have doubled, while the prices of no part of his necessary consumption, except rent, as we have seen, have increased—on the contrary, they have rather diminished. Say then that the rent, which was a fourth part of his expenditure, has increased 1½ times, while his whole wage has doubled, the account, on a wage of 20*s.* fifty years ago, and 40*s.* now, would stand:—

	Fifty Years ago.		Present Time.	
	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>
Wage	20	—	40	—
Deduct for rent	5	—	12	6
Balance for other purposes	15	—	27	6

—showing still an enormous improvement in the workman's condition.

It may be pointed out, however, that houses are undoubtedly of better value all round than they were fifty years ago. More rent is paid because more capital is in the houses, and they are better houses. It appears also that fifty years ago there were far more exemptions than there are now, rural dwellings particularly being favoured as regards exemption. The increase of rent for the same accommodation, there is consequently reason to believe, has not been nearly so great as these figures would appear to show. It has further to be considered that the whole annual value of the dwelling houses under 10*l.* even now is 17,885,000*l.* only, the number of houses being 3,124,000. This must be a very small proportion of the aggregate earnings of those portions of the working classes who live in houses under 10*l.* rent, and even adding to it the value of all the houses up to 20*l.*, which would bring up the total to

34,925,000*l.*, the proportion would still be very small. On the five million families at least of the working classes in Great Britain, the sum would come to about 7*l.* per family, which is not the main portion of an average working man's expenditure.*

We return then to the conclusion that the increase of the money wages of the working man in the last fifty years corresponds to a real gain. While his wages have advanced, most articles he consumes have rather diminished in price, the change in wheat being especially remarkable, and significant of a complete revolution in the condition of the masses. The increased price in the case of one or two articles—particularly meat and house rent—is insufficient to neutralise the general advantages which the workman has gained. Meat formerly was a very small part of his consumption, and allowing to house rent a much larger share of his expenditure than it actually bore, the increase in amount would still leave the workman out of his increased wage a larger margin than he had before for miscellaneous expenditure. There is reason to believe also that the houses are better, and that the increased house-rent is merely the higher price for a superior article which the workman can afford.

It has to be added to all this that while the cost of government has been greatly diminished to the working man, he gets more from the government expenditure than he formerly did. It would not do to count things twice over, and as the benefit to the working man of diminished taxes has already been allowed for in the lower prices of wheat and sugar, we need say nothing more on this head. But few people seem to be aware how, simultaneously with this reduction of the cost of government, there has been an increase of the expenditure of the government for miscellaneous civil purposes, of all of which the workman gets the benefit. It may be stated broadly that nearly 15 million pounds of the expenditure of the central government for education, for the post office, for inspection of factories, and for the miscellaneous purposes of civil government, is entirely new as compared with fifty years ago. So far as the expenditure is beneficial the masses get something they did not get before at all. It is the same even more markedly with local government. In Great Britain, the annual outlay is now about 60 million pounds, as compared with 20 million pounds fifty years

* It may be convenient to note here that the figures as to dwelling houses which I have made use of are those relating to the Inhabited House Duty. The figures as to houses in the income tax returns include shops and factories as well as dwelling houses, and are not available in a question of house-rent. I have also omitted the question of rates. The rates per pound, however, have not increased as compared with what they were formerly, and it would make no material difference if they were to be included. The workman's payment for rates and rent together cannot have increased more than is here stated for rent.

ago. This 20 million pounds was mainly for poor relief and other old burdens. Now the poor relief and other old burdens are much the same, but the total is swollen by a vast expenditure for sanitary, educational, and similar purposes, of all of which the masses of the population get the benefit. To a great deal of this expenditure we may attach the highest value. It does not give bread or clothing to the working man, but it all helps to make life sweeter and better, and to open out careers even to the poorest. The value of the free library, for instance, in a large city, is simply incalculable. All this outlay the workman has now the benefit of as he had not fifty years ago. To repeat the words I have already used, he pays less taxes, and he gets more—much more—from the Government.*

* With regard to this question of prices, I have been favoured since the delivery of this address with the copy of a letter, dated 11th June, 1881, addressed by Mr. Charles Hawkins, of 27, Savile Row, to the editor of the "Daily News," on the cost *per patient* of the expenditure of St. George's Hospital in 1830 and 1880. The facts stated confirm in an interesting way what is here said as to the cost of articles of the workman's consumption fifty years ago and at the present time. Mr. Hawkins, who was at one time one of the treasurers of the hospital, and therefore speaks with authority, gives the following table and notes:—

"Although each patient costs now 1s. 1d. less than in 1830, there have been "great alterations in the different items of expenditure, viz.:—

	Cost per Patient.			
	1830.		1880.	
	s.	d.	s.	d.
Meat	18	4	22	2
Bread and flour.....	10	7	4	1
Wine and spirits	—	10	3	3
Malt liquor.....	5	5	2	6
Milk	6	2	5	11
Tea and grocery.....	3	10	3	5
Drugs	16	5	7	11
Coals and wood	10	6	3	10
Laundry	2	10	4	10
Instruments and surgical appliances	1	9	5	2
Staff;—officers, servants, nurses	20	3	34	3

"Had wheat cost in 1880 what it did in 1830, 1,884*l.* must have been spent "in bread and flour instead of 738*l.* The cost of port wine in 1830 was 7*l.* per "pipe; in 1880 4*l.* In 1830 many of the patients provided themselves with tea "and sugar. Under the head 'Drugs' is included the cost of leeches; in 1846 "14,800 leeches were used, at a cost of 143*l.*; in 1880 only 425, costing 1*l.* 16*s.* "In 1833 another hospital, treating double the number of patients, used 48,900 "leeches, but in 1880 only 250.

"These items show the great advantage of the reduction of price in some "articles of diet, and the great extra expenditure now necessary for the treatment "of hospital patients, depending on the greater call for additional 'staff,' more "especially for nursing, and an altered mode of treatment of accidents and opera- "tions, as also the greater amount of stimulants now exhibited, &c."

As already anticipated, however, the conclusion thus arrived at only carries us part of the way. Assuming it to have been shown that the masses have more money than they had fifty years ago, and that the prices of the chief articles they consume are cheaper rather than dearer, the question remains whether the condition of the masses has in fact been improved. This can only be shown indirectly by statistics of different kinds, which justify conclusions as to the condition of the people to whom they apply. To such statistics I propose now to draw your attention for a moment. I need hardly say that any evidence they contain as to the condition of the people having actually improved corroborates what has been already said as to their having had the means of improvement in their hands. The evidence is cumulative, a point of material importance in all such inquiries.

The first and the most important statistics on this head are those relating to the length of life among the masses of the nation. Do the people live longer than they did? Here I need not detain you. A very effective answer was supplied last session by Mr. Humphreys, in his able paper on "The Recent Decline in the English Death-Rate."* Mr. Humphreys there showed conclusively that the decline in the death-rate in the last five years, 1876-80, as compared with the rates on which Dr. Farr's English Life Table was based—rates obtained in the years 1838-54—amounted to from 28 to 32 per cent. in males at each quinquenniad of the twenty years 5—25, and in females at each quinquenniad from 5—35 to between 24 and 35 per cent.; and that the effect of this decline in the death-rate is to raise the mean duration of life among males from 39.9 to 41.9 years, a gain of 2 years in the average duration of life, and among females from 41.9 to 45.3 years, a gain of nearly $3\frac{1}{2}$ years in the average duration of life. Mr. Humphreys also showed that by far the larger proportion of the increased duration of human life in England is lived at useful ages, and not at the dependent ages of either childhood or old age. This little statement is absolutely conclusive on the subject; but we are apt to overlook how much the figures mean. No such change could take place without a great increase in the vitality of the people. Not only have fewer died, but the masses who have lived must have been healthier, and have suffered less from sickness than they did. Though no statistics are available on this point, we must assume that like causes produce like effects; and if the weaker, who would otherwise have died, have been able to survive, the strong must also have been better than they would otherwise have been. From the nature of the figures also the improvement must have been among the masses, and not among a select class whose figures

* See Statistical Society's *Journal*, vol. xlv, p. 195, &c.

throw up the average. The figures to be affected relate to such large masses of population, that so great a change in the average could not have occurred if only a small percentage of the population had improved in health.

I should like also to point out that the improvement in health actually recorded obviously relates to a transition stage. Many of the improvements in the condition of the working classes have only taken place quite recently. They have not, therefore, affected all through their existence any but the youngest lives. When the improvements have been in existence for a longer period, so that the lives of all who are living must have been affected from birth by the changed conditions, we may infer that even a greater gain in the mean duration of life will be shown. As it is, the gain is enormous. Whether it is due to better and more abundant food and clothing, to better sanitation, to better knowledge of medicine, or to these and other causes combined, the improvement has beyond all question taken place.

The next figures I shall refer to are those well known ones relating to the consumption of the articles which the masses consume. I copy merely the figures in the Statistical Abstract for the years 1840 and 1881:—

Quantities of the Principal Imported and Exciseable Articles retained for Home Consumption, per Head of the Total Population of the United Kingdom.

	1840.	1881.
Bacon and hams lbs.	0'01	13'93
Butter "	1'05	6'36
Cheese "	0'92	5'77
Currants and raisins "	1'45	4'34
Eggs No.	3'63	21'65
Potatoes lbs.	0'01	12'85
Rice "	0'90	16'32
Cocoa "	0'08	0'31
Coffee "	1'08	0'89
Corn, wheat, and wheat flour..... "	42'47	216'92
Raw sugar "	15'20	58'92
Refined sugar "	nil	8'44
Tea "	1'22	4'58
Tobacco..... "	0'86	1'41
Wine galls.	0'25	0'45
Spirits "	0'97	1'08
Malt bshls.	1'59	1'91*

* Year 1878.

This wonderful table may speak for itself. It is an obvious criticism that many of the articles are also articles of home production, so that the increase does not show the real increase

of the consumption of the whole population per head. Assuming a stationary production at home, the increased consumption per head cannot be so much as is here stated for the imported article only. There are other articles, however, such as rice, tea, sugar, coffee, tobacco, spirits, wine and malt, which are either wholly imported, or where we have the exciseable figures as well, and they all—with the one exception of coffee—tell a clear tale. The increase in tea and sugar appears especially significant, the consumption per head now being four times in round figures what it was forty years ago. There could be no better evidence of diffused material well-being among the masses. The articles are not such that the increased consumption by the rich could have made much difference. It is the consumption emphatically of the mass which is here in question.

As regards the articles imported, which are also articles of home production, it has, moreover, to be noted that in several of them, bacon and hams, cheese and butter, the increase is practically from nothing to a very respectable figure. The import of bacon and hams alone is itself nearly equal to the estimated consumption among the working classes fifty years ago, who consumed no other meat.

The only other figures I shall mention are those relating to education, pauperism, crime, and savings banks. But I need not detain you here. The figures are so well known that I must almost apologise for repeating them. I only insert them to round off the statement.

As to education, we have practically only figures going back thirty years. In 1851, in England, the children in average attendance at schools aided by parliamentary grants numbered 239,000, and in Scotland 32,000; in 1881 the figures were 2,863,000 and 410,000. If anything is to be allowed at all in favour of parliamentary grants as raising the character of education, such a change of numbers is most significant. The children of the masses are, in fact, now obtaining a good education all round, while fifty years ago the masses had either no education at all or a comparatively poor one. Dropping statistics for the moment, I should like to give my own testimony to an observed fact of social life—that there is nothing so striking or so satisfactory to those who can carry their memories back nearly forty years, as to observe the superiority of the education of the masses at the present time to what it was then. I suppose the most advanced common education forty or fifty years ago was in Scotland, but the superiority of the common school system there at the present day to what it was forty years ago is immense. If Scotland has gained so much, what must it have been in England where there was no national system

fifty years ago at all? Thus at the present day not only do we get all children into schools, or nearly all, but the education for the increased numbers is better than that which the fortunate few alone obtained before.

Next as to crime, the facts to note are that rather more than forty years ago, with a population little more than half what it is now, the number of criminal offenders committed for trial (1839) was 54,000; in England alone 24,000. Now the corresponding figures are, United Kingdom 22,000, and England 15,000; fewer criminals by a great deal in a much larger population. Of course the figures are open to the observation that changes in legislation providing for the summary trial of offences that formerly went to the assizes may have had some effect. But the figures show so great and gradual a change, that there is ample margin for the results of legislative changes, without altering the inference that there is less serious crime now in the population than there was fifty years ago. Thus an improvement as regards crime corresponds to the better education and well-being of the masses.

Next as regards pauperism; here again the figures are so imperfect that we cannot go back quite fifty years. It is matter of history however that pauperism was nearly breaking down the country half-a-century ago. The expenditure on poor relief early in the century and down to 1830-31 was nearly as great at times as it is now. With half the population in the country that there now is, the burden of the poor was the same. Since 1849, however, we have continuous figures, and from these we know that, with a constantly increasing population, there is an absolute decline in the amount of pauperism. The earliest and latest figures are:—

Paupers in Receipt of Relief in the undermentioned Years at given Dates.

	1849.	1881.
England	934,000	803,000
Scotland	122,000*	102,000
Ireland	620,000	109,000
United Kingdom....	1,676,000	1,014,000

* 1859.

Thus in each of the three divisions of the United Kingdom there is a material decline, and most of all in Ireland, the magnitude of the decline there being no doubt due to the fact that the figures are for a period just after the great famine. But how remote we seem to be from those days of famine.

Last of all we come to the figures of savings banks. A fifty

years' comparison gives the following results for the whole kingdom:—

	1831.	1881.
Number of depositors	429,000	4,140,000
Amount of deposits	£13,719,000	£80,334,000
„ per depositor	£32	£19

An increase of ten-fold in the number of depositors, and of five-fold and more in the amount of deposits! It seems obvious from these figures that the habit and means of saving have become widely diffused in these fifty years. The change is of course in part due to a mere change in the facilities offered for obtaining deposits; but allowing ample margin for the effect of increased facilities, we have still before us evidence of more saving among the masses.

There is yet one other set of statistics I should like to notice in this connection, those relating to the progress of industrial and provident co-operative societies in England and Wales. These I extract from the special appendix to the “Co-operative Wholesale Society's Annual Almanac and Diary” for the present year (pp. 81 and 82). Unfortunately the figures only go back to 1862, but the growth up to 1862 appears to have been very small. Now, however, most material advance is shown:—

	1862.	1881.
Number of members	90,000	525,000
Capital—	£	£
Share	428,000	5,881,000
Loan	55,000	1,267,000
Sales	2,333,000	20,901,000
Net profit	165,000	1,617,000

Such figures are still small compared with what we should like to see them, but they at least indicate progress among the working classes, and not retrogression or standing still.

To conclude this part of the evidence, we find undoubtedly that in longer life, in increased consumption of the chief com-

modities they use, in better education, in greater freedom from crime and pauperism, and in increased savings, the masses of the people are better, immensely better, than they were fifty years ago. This is quite consistent with the fact, which we all lament, that there is a residuum still unimproved, but apparently a smaller residuum, both in proportion to the population and absolutely, than was the case fifty years ago; and with the fact that the improvement, measured even by a low ideal, is far too small. No one can contemplate the condition of the masses of the people without desiring something like a revolution for the better. Still, the fact of progress in the last fifty years—progress which is really enormous when a comparison is made with the former state of things—must be recognised. Discontent with the present must not make us forget that things have been so much worse.

But the question is raised: Have the working classes gained in proportion with others by the development of material wealth during the last fifty years? The question is not one which would naturally excite much interest among those who would answer the primary question as to whether the working classes have gained or not, as I have done, in the affirmative. Where all are getting on, it does not seem very practical in those who are getting on slowly to grudge the quicker advance of others. Usually those who put the question have some vague idea that the capitalist classes, as they are called, secure for themselves all the benefits of the modern advance in wealth; the rich, it is said, are becoming richer, and the poor are becoming poorer. It will be convenient then to examine the additional question specifically. If the answer agrees with what has already been advanced, then, as nobody doubts that material wealth has increased, all will be forced to admit that the working classes have had a fair share.

At first sight it would appear that the enormous figures of the increase of capital, which belong, it is assumed, to the capitalist classes, are inconsistent with the notion of the non-capitalist classes having had a fair share. In the paper which I read to the Society four years ago, on "The Recent Accumulations of Capital" "in the United Kingdom," the conclusion at which I arrived was that in the ten years 1865-75 there had been an increase of 40 per cent. in the capital of the nation, and 27 per cent. in the amount of capital per head, that is allowing for the increase of population. Going back to 1843, which is as far as we can go back with the income tax returns, we also find that since then the gross assessment, allowing for the income from Ireland not then included in the returns, has increased from 280 million pounds to 577 million pounds, or more than 100 per cent., in less than fifty

years. Assuming capital to have increased in proportion, it is not to be wondered at that the impression of a group of people called the capitalist classes getting richer and richer while the mass remain poor or become poorer, should be entertained. Allowing for the increase of population, the growth of capital and income tax income are really much smaller than the growth of the money income of the working classes, which we have found to be something like 50 to 100 per cent. and more per head in fifty years, but the impression to the contrary undoubtedly exists, and is very natural.

The error is partly in supposing that the capitalist classes remain the same in number. This is not the case; and I have two pieces of statistics to refer to which seem to show that the capitalist classes are far from stationary, and that they receive recruits from period to period—in other words, that wealth, in certain directions, is becoming more diffused, although it may not be diffusing itself as we should wish.

The first evidence I refer to is that of the probate duty returns. Through the kindness of the Commissioners of Inland Revenue, I am able to put before you a statement of the number of probates granted in 1881, and of the amounts of property “proved,” with which we may compare similar figures published by Mr. Porter in his “Progress of the Nation” for 1838. I am sorry to say Mr. Porter’s figures for 1838 are far more detailed than those I am able to give; a more minute comparison would be most instructive; but I was unfortunately too late in applying to the Commissioners of Inland Revenue for the details which I found they were most willing to give. However, the statement they supplied to me, and the comparison which can thus be made, seem most instructive. They are as follows:—

Statement of Number of Probates granted in 1882, with Amounts of Property Proved, and Average per Probate [from figures supplied by the Commissioners of Inland Revenue]; and comparison with a similar statement for 1838. [From Porter’s “Progress of the Nation,” p. 600 et seq.]

	Number of Probates.		Amount of Property.		Amount of Property per Estate.	
	1882.	1838.	1882.	1838.	1882.	1838.
			£	£	£	£
England	45,555	21,900	118,120,961	47,604,755	2,600	2,170
Scotland	5,221	1,272	13,695,314	2,817,260	2,600	2,200
Ireland	4,583	2,196	8,544,579	4,465,240	1,900	2,000
United Kingdom	55,359	25,368	140,360,854	54,887,255	2,500	2,160

Thus, in spite of the enormous increase of property passing at death, amounting to over 150 per cent., which is more than the increase in the income tax income, the amount of property per estate has not sensibly increased. The increase of the number of estates is more than double, and greater therefore than the increase of population, but the increase of capital per head of the capitalist classes is in England only 19 per cent., and in the United Kingdom only 15 per cent. Curiously enough, I may state, it is hardly correct to speak of the capitalist classes as holding this property, as the figures include a small percentage of insolvent estates; but allowing all the property to belong to the capitalist classes, still we have the fact that those classes are themselves increasing. They may be only a minority of the nation, though I think a considerable minority, as 55,000 estates passing in a year represent from 1,500,000 to 2,000,000 persons as possessing property subject to probate duty; and these figures, it must be remembered, do not include real property at all. Still, small or large as the minority may be, the fact we have before us is that in the last fifty years it has been an increasing minority, and a minority increasing at a greater rate than the increase of general population. Wealth to a certain extent is more diffused than it was.

If I had been able to obtain more details, it would have been possible to specify the different sizes of estates and the different percentages of increase, from which it would not only have appeared whether the owners of personal property were increasing in number, but whether the very rich were adding to their wealth more than the moderately rich or *vice versâ*. But it is something to know at least that there are more owners. I trust the Commissioners of Inland Revenue will see their way in their next report to give more details on this very interesting point.*

Before passing on I should like to add a caution which may not be necessary in this room, but which may be needed outside. All such figures must be taken with a good deal of qualification, owing to variations of detail in the method of levying the duty at different times, variations in the character of the administration, and the like causes. I notice, for instance, an unusually remarkable increase both in the number of owners and amount of property passing in Scotland; this last fact, I believe, having already given rise to the statement that there has been something unexampled in the increase

* It appears that the increase in the number of probates for less than 1,000*l.* is from 18,490 to 41,278, or about 120 per cent.; the average value per probate being much the same; while the increase of the number of probates for more than 1,000*l.* is from 6,878 to 12,629, or over 80 per cent., and the average value per probate has increased from 7,150*l.* to 9,200*l.*

of personal property in Scotland. The explanation appears to be, however, that the increase of property in Scotland is, to some extent, only apparent, being due partly, for instance, to the fact that by Scotch law mortgages are real property, whereas in England they are personal property, so that it was necessary, in the course of administering the tax, to pass a special law enabling the Commissioners of Inland Revenue to bring Scotch mortgages into the category of personal property.* This is only one illustration of the caution with which such figures must be used. Taking them in the lump, and not pressing comparisons between the three divisions of the United Kingdom, or any other points of detail which might be dangerous, we appear to be safe in the main conclusion that the number of owners of personal property liable to probate duty has increased in the last fifty years more than the increase of population, and that on the average these owners are only about 15 per cent. richer than they were, while the individual income of the working classes has increased from 50 to 100 per cent.

The next piece of statistics I have to refer to is the number of separate assessments in that part of Schedule D known as Part I, viz., Trades and Professions, which excludes public companies and their sources of income, where there is no reason to believe that the number of separate assessments corresponds in any way to the number of individual incomes. Even in Part I there can be no exact correspondence, as partnerships make only one return, but in comparing distant periods, it seems not unfair to assume that the increase or decrease of assessments would correspond to the increase or decrease of individual incomes. This must be the case unless we assume that in the interval material differences were likely to arise from the changes in the number of partnerships to which individuals belonged, or from partnerships as a rule comprising a greater or less number of individuals. Using the figures with all these qualifications, we get the following comparison:—

* See "Special Report of Commissioners of Inland Revenue," 1870, vol. i, p. 99. The law on this and other points was altered by 23 and 24 Vict., cap. 80.

*Number of Persons at different Amounts of Income Charged under Schedule D in 1843 and 1879-80 compared [in England].**

		1843.	1879-80.
£	£		
150 and under	200....	39,366	130,101
200	300....	28,370	88,445
300	400....	13,429	39,896
400	500....	6,781	16,501
500	600....	4,780	11,317
600	700....	2,672	6,894
700	800....	1,874	4,054
800	900....	1,442	3,595
900	1,000....	894	1,396
1,000	2,000...	4,228	10,352
2,000	3,000....	1,235	3,131
3,000	4,000....	526	1,430
4,000	5,000....	339	758
5,000	10,000....	493	1,439
10,000	50,000....	200	785
50,000 and upwards	....	8	68
Total		106,637	320,162

* The figures for 1843 cannot be given for either Scotland or Ireland.

Here the increase in all classes, from the lowest to the highest, is between two and three times, or rather more than three times, with the exception of the highest class of all, where the numbers, however, are quite inconsiderable. Again a proof, I think, of the greater diffusion of wealth so far as the assessment of income to income tax under Schedule D may be taken as a sign of the person assessed having wealth of some kind, which I fear is not always the case. If the owners of this income, at least of the smaller incomes, are to be considered as not among the capitalists, but among the working classes—a very arguable proposition—then the increase of the number of incomes from 150*l.* up to say 1,000*l.* a-year, is a sign of the increased earnings of working classes, which are not usually thought of by that name. The increase in this instance is out of all proportion to the increase of population.

In giving these figures I have omitted the incomes under 150*l.* There is quite a want of satisfactory data for any comparison, I think, except as regards incomes actually subject to assessment, and the data at the beginning of the period are specially incomplete.

Whichever way we look at the figures therefore we have this result, that while the increase of personal property per head of the capitalist class, according to the probate returns, is comparatively small, being only about 15 per cent., yet there is an increase of the number of people receiving good incomes from trades and professions out of all proportion to the increase of population. We

cannot but infer from this that the number of the moderately rich is increasing, and that there is little foundation for the assertion that the rich are becoming richer. All the facts agree. The working classes have had large additions to their means: capital has increased in about equal ratio; but the increase of capital per head of the capitalist classes is by no means so great as the increase of working class incomes.

I should wish farther to point out, however, that it is a mistake to speak of the income in the various schedules to the income tax as the income of a few, or exclusively of classes which can be called capitalist or rich. A suspicion of this has already been raised by the facts as to trades and professions. Let me just mention this one little fact in addition. Out of 190,000,000*l.* assessed under Schedule A in 1881-82, the sum of 11,359,000*l.* was exempted from duty as being the income of people whose whole income from all sources was under 150*l.* a-year. If we could get at the facts as to how the shares of public companies are held, and as to the immense variety of interests in lands and houses, we should have ample confirmation of what has already appeared from the probate duty figures, that there is a huge minority interested in property in the United Kingdom, great numbers of whom would not be spoken of as the capitalist classes.

To test the question as to whether there has been any disproportionate increase of capital, and of the income from it, in yet another way, I have endeavoured to make an analysis of the income tax returns themselves, distinguishing in them what appears to be the income of idle capital from income which is derived not so much from the capital itself as from the labour bestowed in using the capital. Only the roughest estimate can be made, and the data, when we go back to 1843, are even more incomplete than they are now; but I have endeavoured as far as possible to give everything to capital that ought to be given, and not to err on the side of assigning it too small a share. The whole of Schedule A is thus assigned to capital, although it is well known that not even in Schedule A is the income obtained without exertion and care, and some risk of loss, which are entitled to remuneration. In Schedule D also I have allowed that all the income from public companies and foreign investments is from idle capital, although here the vigilance necessary, and the risks attendant on the business, are really most serious, and part of the so-called profit is not really interest on idle capital at all, but strictly the remuneration of labour. I have also rather exaggerated than depreciated the estimate for capital employed in trades and professions, my estimate being rather more than that of Mr. Dudley Baxter in his famous paper on the National Income. With these explanations I submit

the following estimate of the share of capital in the income tax income at different dates :—

Analysis of the Income Tax Returns for the undermentioned Years, showing the Estimated Income from Capital on the one side, and the Estimated Income from Wages of Superintendence and Salaries on the other side.

[In million of pounds, 000,000's omitted, i.e., 10 = 10,000,000.]

	1881.		1862.		1843.	
	From Capital.	From Salaries, &c.	From Capital.	From Salaries, &c.	From Capital.	From Salaries, &c.
Schedule A—						
Lands, tithes, &c., exclu- }	70,	nil	60,	nil	57,	nil
sive of houses						
Messuages, &c.	117,	nil	62,	nil	41,	nil
Schedule B—						
Occupation of land	25,*	44,	22½,	38½,	20,	36,
Schedule C	40,	nil	29,	nil	29,	nil
„ D (Part I)	64,†	100,†	32,	49,	29½,	46½,
„ „ („ II)	91,	nil	47,	nil	12,	nil
„ E	nil	33,	nil	20,	nil	11,
	407,	177,	252½,	107½,	188½,	93½,

Note.—In the estimate for 1843 the figures assigned to Schedule A are only those of lands and tithes and houses to correspond with the existing Schedule A: and the figures of Schedule D include mines, quarries, railways, &c., now in Schedule D. An estimate is also made of the totals for Ireland, based on the returns of 1854, the total gross income under all the schedules thus estimated being about 30 million pounds.

* Interest on 500 millions of capital in 1881 at 5 per cent. In my paper on accumulations of capital, I estimated agricultural capital at a larger sum than this, but since then there has been some loss of agricultural capital, and if a larger sum were taken, the rate of interest used in the calculation for the present purpose should be less.

† Estimating that the income here is worth four years' purchase, and that it may be capitalised at that rate; and then allowing that this capital earns 10 per cent., the rest being wages of superintendence or salaries.

This estimate may be summarised as follows :—

Summary of Analysis of Income Tax Income in undermentioned Years.

[In millions of pounds.]

Year.	From Capital.	From Salaries, &c.	Total.
	£	£	£
1843.....	188½	93½	282
'62.....	252½	107½	360
'81.....	407	177	584

Thus a very large part of the increase of the income tax income in the last forty years is not an increase of the income from capital

at all in any proper sense of the word. On the contrary, the increase in the income from capital is only about two-thirds of the total increase. This increase is, moreover, at a less rate than the increase of the capital itself, as appearing from the probate duty returns,* a point which deserves special notice. The conclusion therefore is, that the working classes have not been losing in the last fifty years through the fruits of their labour being increasingly appropriated to capital. On the contrary, the income from capital has at least no more than kept pace with the increase of capital itself, while the increase of capital per head, as we have seen, is very little; so that it may be doubted whether the income of the individual capitalist from capital has on the average increased at all. If the return to capital had doubled, as the wages of the working classes appear to have doubled, the aggregate income of the capitalist classes returned to the income tax would now be 800 instead of 400 millions. In other words it would not be far short of the mark to say that almost the whole of the great material improvement of the last fifty years has gone to the masses. The share of capital is a very small one. And what has not gone to the workman so-called, has gone to remunerate people who are really workmen also, the persons whose incomes are returned under Schedule D, as from "Trades and Professions." The capitalist as such gets a low interest for his money, and the aggregate return to capital is not a third part of the aggregate income of the country, which may be put at not less than 1,200 millions, and is, I should estimate, not much more than a fourth part.

It will be interesting I think to present these conclusions in the form of an account. We have not, as I have already said, an exact statement of aggregate earnings, either at the beginning or at the end of the period; but assuming the aggregate income of the people as about 1,200 millions now, and that the wages of working men are, per head, twice what they were, the aggregates in 1843 and at the present time would compare as follows:—

Progress of National Income.

[In millions of £'s.]

	Income in 1843.	Income at Present Time.	Increase.	
			Amount.	Per Cent.
	£	£	£	
Capitalist classes from capital...	190	400	210	110
Working income in income tax returns	90	180	90	100
Working income not in in- come tax returns	235	620	385	160
	515	1,200	685	130

* These returns, however, it should always be remembered, do not include real property.

Progress of National Capital Paying Probate Duty.

	1838.	Present Time.	Increase.	
			Amount.	Per Cent.
Amount of capital	£ 55 mlns.	£ 140 mlns.	£ 85 mlns.	155
„ per estate	2,200	2,500	300	14

Note.—Increase of working income per head 100 per cent.

From this it appears that the increase of what is known as working class income in the aggregate is greater than that of any other class, being 160 per cent., while the return to capital and the return to what are called the capitalist classes, whether it is from capital proper or, as I maintain, a return only in the nature of wages, has only increased about 100 per cent., although capital itself has increased over 150 per cent. At the same time the capitalist classes themselves have greatly increased in number, so that the amount of capital possessed among them per head has only increased 15 per cent., notwithstanding the great increase in capital itself, and the average income per head can have hardly increased at all. On the other hand, as the masses of the nation, taking the United Kingdom altogether, have only increased about 30 per cent. since 1843, when these income tax figures begin, while their aggregate incomes have increased 160 per cent., it is explained how these incomes have gained, individually, about 100 per cent. as against hardly any increase at all in the incomes of what are called the capitalist classes, on the average. Thus the rich have become more numerous, but not richer individually; the “poor” are, to some smaller extent, fewer; and those who remain “poor” are, individually, twice as well off on the average as they were fifty years ago. The “poor” have thus had almost all the benefit of the great material advance of the last fifty years.

We may now conclude this long inquiry. It has been shown directly, I believe, that, while the individual incomes of the working classes have largely increased, the prices of the main articles of their consumption have rather declined; and the inference as to their being much better off which would be drawn from these facts is fully supported by statistics showing a decline in the rate of mortality, an increase of the consumption of articles in general use, an improvement in general education, a diminution of crime and pauperism, a vast increase of the number of depositors in savings banks, and other evidences of general well-being. Finally, the

increase of the return to capital has not been in any way in proportion, the yield on the same amount of capital being less than it was, and the capital itself being more diffused, while the remuneration of labour has enormously increased. The facts are what we should have expected from the conditions of production in recent years. Inventions having been multiplied, and production having been increasingly efficient, while capital has been accumulated rapidly, it is the wages receivers who must have the benefit. The competition of capital keeps profits down to the lowest point, and workmen consequently get for themselves nearly the whole product of the aggregate industry of the country. It is interesting, nevertheless, to find that the facts correspond with what theory should lead us to anticipate.

The moral is a very obvious one. Whatever may be said as to the ideal perfection or imperfection of the present economic *régime*, the fact of so great an advance having been possible for the masses of the people in the last half-century is encouraging. It is something to know that whether a better *régime* is conceivable or not, human nature being what it is now (and I am one of those who think that the *régime* is the best, the general result of a vast community living as the British nation does, with all the means of healthy life and civilization at command, being little short of a marvel if we only consider for a moment what vices of anarchy and misrule in society have had to be rooted out to make this marvel); still, whether best or not, it is something to know that vast improvement has been possible with this *régime*. Surely the lesson is that the nation ought to go on improving on the same lines, relaxing none of the efforts which have been so successful. Steady progress in the direction maintained for the last fifty years must soon make the English people vastly superior to what they are now.

I should like to add just one or two remarks bearing on questions of the moment, and as to the desirability or possibility of a change of *régime* now so much discussed, which the figures I have brought before you suggest. One is, that apart from all objections of principle to schemes of confiscating capital,—land nationalisation, or collectivism, or whatever they may be called,—the masses could not hope to have much to divide by any such schemes. Taking the income from capital at 400 million pounds, we must not suppose that the whole of that would be divisible among the masses if capital were confiscated. What the capitalist classes spend is a very different thing from what they make. The annual savings of the country now exceed 200 million pounds, being made as a rule, though not exclusively, by the capitalist classes. If then the 400 million pounds were to be confiscated, one of two things would

happen: either the savings would not be made, in which case the condition of the working classes would soon deteriorate, for everything depends upon the steady increase of capital; or the savings would be made, in which case the spending power of the masses would not be so very much increased. The difference would be that they would be owners of the capital, but the income would itself remain untouched. The system under which large capitals are in a few hands may, in fact, have its good side in this, that the Jay Goulds, Vanderbilts, and Rothschilds cannot spend their income. The consequent accumulation of capital is, in fact, one of the reasons why the reward for labour is so high, and the masses get nearly all the benefit of the great increase of production. The other remark I have to make is that if the object really aimed at by those who talk of land nationalisation and the like is carried out, the people who will suffer are those who receive large wages. To effect what they intend, the agitators must not merely seize on the property of a few, they must confiscate what are as much earnings as those of a mechanic or a labourer, and the wages of the most skilled mechanics and artizans themselves. The agitation is, in fact, to level down, to diminish the reward of labourers who receive a large wage because they can do the work the community requires, the proof being that in a market without favour they get the wage, and to increase the reward of other labourers beyond what in the same free market the community would freely give them. Whether the production would be continued at all if there were any success in these attempts, common sense will tell us. Those who have done some hard work in the world will, I am sure, agree with me that it is only done by virtue of the most powerful stimulants. Take away the rewards, and even the best would probably not give themselves up to doing what the community wants and now pays them for doing, but they would give themselves up either to idleness or to doing something else. The war of the land nationalizer and socialist is then not so much with the capitalist as with the workman, and the importance of this fact should not be lost sight of.

PROCEEDINGS *on the* 20th NOVEMBER, 1883.

SIR RAWSON W. RAWSON, C.B., K.C.M.G., said the President had referred to him as one of the oldest members of the Society, and, he was sorry to say, had spoken truthfully in that matter; he would therefore avail himself of his position to rise and propose the thanks of the Society to the President for his unusually powerful, able, and opportune address. He could not imagine a subject more appropriate for the inauguration of the anniversary session of their Society. They began by working for the poor of their country, and in their fiftieth year they continued to point out to the labouring classes their real condition, and to enable them to judge for themselves whether they were not now in a position far better than they were years ago; and that not simply by their own industry, but by the sympathy and co-operation of the classes with whom they were living and working. It was not solely by their own efforts that they had gained that position; it was in no small degree by the sympathy and co-operation of their employers, their friends, and of all classes of society. Exceptions there were in the upper classes, exceptions there were in the lower classes; but the masses had never been more welded together than they were at the present time. He wished to confirm what the President had said with regard to the commencement of their labours. The first matters that the Society inquired into were the wretched habitations of the poor in London, and the wretched day schools in which they were educated. He remembered being a member of a committee which visited some of those lodging houses in Orchard Street, near Portland Square, Calmell Buildings, where, at night, they could not walk across a room without treading upon some human being lying asleep, or trying to get to sleep, on the floor. The same state of things prevailed in Marylebone, behind Bryanston Square and behind Grosvenor Square. These things had been driven out from those parts of London to a very great extent, and they were being driven out daily from the outskirts. Public sympathy, public interest, had been aroused, and large efforts were being made by every class of society in order to eradicate these sources of misery to the classes whom they affected—these sources of danger to the people of the country. He could not imagine any subject more interesting to be brought before the Society on the present occasion; and all who had heard the paper would agree that it could scarcely have been brought forward in a more effective manner than it had been by their President. They were his debtors not only for the paper he had brought before them, but for the sacrifice of time which he, in the midst of his most important and most onerous labours, had made on their behalf and for the benefit of the public. In the midst of his most pressing avocations he had written a paper which was remarkable in itself, and would remain a monument to his industry, and his talent, and to his desire to do good. He therefore arrogated to himself the

right on their behalf, believing that he possessed their authority, to return the President their best thanks for the very interesting address which he had delivered.

Mr. FREDERICK HENDRIKS said he would be glad to be permitted to say a few words in support of the resolution to thank the President for his able address. The subject it dealt with had been much pressed upon the public notice during the last hundred years by a long series of writers, some of them perfectibilians, others deteriorationists, or who might be otherwise termed optimists and pessimists. It was a kind of duel of opinion as to whether the working classes were going to complete ruin, or whether, on the contrary, their condition was not really improving? At the earlier stage of such inquiries, say, for example, at the time when Dr. Price wrote, or Sir Frederick Morton Eden published his "History of the Poor," there was a dearth of such statistical illustrations as were now available on the subject, and the conclusions advanced as true or false were but imperfectly confirmed by the test of trustworthy figures like those which Mr. Giffen had marshalled with so much skill in his address, and which seemed as it were to cover the whole field of inquiry, and to afford an excellent defence against the arguments of would be levellers of society at large. The paper indeed might aptly be termed "An easy method with the Socialists," and it was earnestly to be hoped that it might be widely disseminated amongst the working men of this country through their clubs and reading rooms. It would thus serve to dissipate many delusions. It was perhaps almost too much to hope for that it might gain any extensive foreign circulation, although the facts it mentioned and the lessons it illustrated would be useful also to readers abroad. It did not seem from the recent experience of British workmen who had met foreign workmen at the Socialist Congress in Paris, that there was any great bond of sympathy in their respective views, whilst there was certainly great ignorance as to the really improved prospects of the British labourer, skilled or unskilled, and which a paper like Mr. Giffen's would go far to remove. Mr. Giffen's figures afforded a most gratifying illustration in confirmation of a view long held by many members of the Statistical Society, that through good report and evil report, the truth is that the British working man's position has really been advancing for a long period of time in as great, if not a greater, ratio of prosperity than that of other classes of the community. First of all there was the agricultural labourer. His wages had in many places increased by from 60 to 100 per cent. in the lifetime of many present in the room that evening. This was not all. His position had been improved from that of what might be called that of a mere "animated vegetable," into that of a comparatively respectable and fairly well cared for member of the community. The seaman's wages had advanced nearly as much, the scale of his diet had been vastly improved, the healthiness and ventilation of his home at sea looked after, his savings well guarded, and seamen's homes at all the chief ports provided for his use, with drainage and all other sanitary conditions, better probably than

could be secured by the higher classes of society with any certainty in choosing houses or apartments on their visits to the coast. Lastly there was the industrial artisan. His wages had, as was shown, increased even more than those of the agricultural labourer or of the seaman. But this larger increase in his case was only what was to be expected, when it was kept in mind that as a rule the factory workman had been employed in industries where the progress of modern invention had worked vast and profitable improvements in methods of manufacture. Altogether, although it might seem to some that Mr. Giffen's picture was tinted with such uniformly warm colouring as to favour the views of optimists, it rested on such solid statistical facts that it had been listened to with much gratification by the large audience that night, who would sleep all the sounder with the reflections afforded by the really comforting conclusions of Mr. Giffen, and which would increase the fame he had already earned by the remarkable addresses he had given all through his Presidentship of the Statistical Society.

The resolution was carried by acclamation.

The PRESIDENT having acknowledged the vote of thanks, and having presented to Dr. R. D. R. Sweeting, of the Fulham District Fever Hospital—the winner of the Howard Medal for 1883—the medal and the cheque for 20*l.* which the Society had awarded to him, the Society adjourned to the 18th December.

“ECONOMIC SCIENCE *and* STATISTICS.” *The ADDRESS of the PRESIDENT of SECTION F of the BRITISH ASSOCIATION, at the FIFTY-THIRD MEETING, held at SOUTHPORT, in September, 1883. By R. H. INGLIS PALGRAVE, ESQ., F.R.S., &c.*

THE post of President of this Section is one which any man who is honoured by the choice of the Council of the Association must feel considerable diffidence in accepting. There are two main reasons which lead to this. First, he sees on the roll of your presidents a long list of names of men whose distinction he cannot hope to equal; next, he finds in the growing scope of the subjects discussed at your meetings an ever-widening field of investigation, the whole of which he can never hope to master. The very name of the section bears witness to this extension of its subject-matter for inquiry. Established originally as the Section for Statistics, it remained under this title for more than twenty years. Extending then, and rightly, its scope beyond the limits of statistics alone, it undertook to deal with that branch of science to which statistics are especially useful, and became the Section of Economic Science and Statistics, the title retained until the present day. This very difference in the designation marks out the development of thought on the subject, a development which I may remark has been greatly assisted by the labours of my distinguished predecessors in this chair. Their names suggest great variety of pursuits, great difference of study, but I find one common link uniting the modes of thought of all, a desire to promote the interest of economic science, and a desire also in practice to promote the best interests of the empire, by the application, where possible, of the laws of that science to the pursuits of ordinary life. Thus, among the names of earlier presidents of this section, there are those of Mr. Babbage and of Mr. Henry Hallam, the latter known to the present generation as an historian of the very highest rank, but known also in his own time as taking a warm interest in all matters which concerned the social well-being of the country. Among those former presidents who have taken a prominent and valued share in public life, are the names of Mr. W. E. Forster and the present Postmaster-General, whose connection with economic science is marked by the fact that he is even better known throughout the country as Professor Fawcett, than as the holder of his high office. Considerations of space will not permit me to mention many other names, but I may refer to Mr. Tooke, who in his great work on the history of prices combined so admirably

statistical method with a scientific exposition of results; and to his perhaps abler disciple Mr. William Newmarch, from whom I had myself the privilege to learn much, especially during the latter years of his life. Of others whom I have had the advantage of knowing, I may name Mr. James Heywood, whose continued labours in the service of the association show that our branch of study is well to be reconciled with a calm and thoughtful life, and who keeps up a warm interest in the work of the section over which he presided thirty years ago. My list of the more recent presidents must close with Professor Jevons, too early lost to economic study, and Professor Ingram. I have mentioned in particular Professor Ingram's name. I well remember the enthusiastic language in which Mr. Newmarch spoke to me of his address before this section. Bearing this in mind, I wish in the first place to bring to the remembrance of the present meeting the manner in which Professor Ingram claimed for the science of social life a place in the highest ranks as a branch of investigation.

In many respects this claim is generally conceded.

The position which economic science occupies in this country shows how strong is the hold it possesses over public opinion. Whether our statesmen at all times interpret its teaching accurately or not, they feel bound to profess a deference to that teaching, or at least to explain the reasons why they differ from it. And this is rightly the case. At all times since this country began to commence that remarkable development of ripening, in gradual, calm, steady progress, from what, for want of a better term, I must style mediæval, to modern modes of thought, on which it still continues, a growth, as it seems to me, unexampled in the history of any other nation, there have been among its citizens able teachers of economic truth. Opinions expressed in the reign of Queen Elizabeth by Sir Thomas Gresham, those held during the reign of Charles II by Sir William Petty, are current at the present time, because they are based on careful observation and sound reasoning. Our commercial policy is now based on lines laid down nearly a century since by Adam Smith. And the brilliant success which has followed the financial measures carried out by Sir Robert Peel and Mr. Gladstone, results from the ability with which those statesmen applied the principles of economic teaching to the circumstances of the period with which they were surrounded. This brief summary indicates the points in which economic teaching is most sharply brought home to the minds of the majority of those who think about it at all at the present time. They do not so much think about it as a science, as in that subdivision of its study which I may best call an art. They say it has brought in free trade. They say also that while free trade has caused marvellous

prosperity to this country, other countries do very well without it. Hence they doubt, on what they call practical grounds, the teaching of economic science.

I do not intend to enter into this controversy here, though I think there can be no doubt on which side the truth lies. But I merely use this as an illustration. If economic teaching will produce wealth, it is, many people think, worth studying on those grounds. If it will not, it is not, in their opinion, worth following. Now, while I most distinctly desire to assert that nations may, by listening to the lessons of sound economic teaching, advance their prosperity in many ways, as they have done by following free trade, yet we must not limit the scope of the science to investigating the production of wealth alone. We do not say that the sole object of the science of chemistry is to improve health, though the health of the inhabitants of this country has been benefited in no small degree by attending, however imperfectly, to the teaching of chemical science.

What, then, should the course of action of the careful student of economic thought be at the present time? We must not think that the study of the production and distribution of wealth alone is the sole object of economic science; nor, again, that everything which the science has to teach has been discovered and taught already; that we have now but to classify results, to expound to all future generations text-books which have been written by our forefathers; that the whole kingdom over which observation may extend has been explored and mapped out; that everything which can be said on these subjects has been said already. If we did this we should place ourselves entirely and hopelessly in the wrong. Even Homer, as the fine Greek proverb has it, is not "enough for" "everything." We should, by following this course, limit ourselves in a manner which none who have sought to work in a scientific spirit have ever done in any other branch of research, and should restrict the study, the bounds of which we should desire to extend, into becoming merely a record of the past—an empty record, also, for instead of our investigation being instinct with life, it would soon become a mere series of dead reminiscences.

In saying this I am not unmindful of the very sagacious remark made by Professor Ingram, to whose discourse, delivered to this section at Dublin, I have referred before. Speaking of political economy, he observed, "It is the most difficult of all the sciences, "because it is that in which the phenomena dealt with are the "most complex, and dependent on the greatest variety of conditions, and in which, accordingly, appearances are most deceitful, "and error takes the most plausible forms." Bearing this warning in mind, and remembering the limitations already laid down as to

those points which we should shun, let us proceed to consider in what direction lies the true course of economic progress.

And here I shall best point out the process through which our study may be aided if I quote from a work which, though it may not in all respects fully come up to the promise of its title, yet contains within its pages a great storehouse of genuine thought—the “*Novum Organum Renovatum*” of Dr. Whewell. The first chapter of Dr. Whewell’s second book, which deals with the construction of science, commences thus:—*The two processes by which science is constructed are the explication of conceptions, and the colligation of facts.* The definition contained in this statement is so clear and complete that it may almost pass for a truism. But it contains the axiom on which every science must be founded. Our own observation places before us constantly the texts of the book of economic science, but, as has been well said, “these convey no knowledge to us till we have discovered the alphabet by which they are to be read.”

Here, again, we shall do well to bear in mind the warning just quoted as to economic science being the most difficult of all the sciences, because in it error takes the most plausible forms. It is because this science deals with the facts of social life, with matters which all can observe, and consequently think themselves capable of judging, that it appears to be so easy and in reality is so difficult.

Again, let us consider the circumstances under which the study of political economy has to be carried on. Political economy exists both as the science which solves the problems of social existence, and as the art in which that science is applied in practice to ordinary life. Now, it differs from almost every other branch of science in the fact that in it scarcely any experiment is ever possible. We cannot, to revert to a point previously mentioned, call the application of the principle of free trade to the financial legislation of this country an experiment. It was the work of men confident in their science; justly confident, because they felt certain, from the teachings of that science, that the act would succeed.

But since experiment cannot be tried, what course should the student follow? At this point we may with advantage glance for a moment at the two schools into which economic writers have principally shown a tendency to divide of late years—the historic and the philosophic schools. A science which deals with the facts of human life, and yet does not admit of experiment, must be the more indebted to observation. Here, we may see, is the opportunity for those who follow the historical method. But mere observation directed by no principle is unaware what facts it should gather, or how the connection of these facts should be explained. Hence the work is incomplete without the application

of correct theory. This arrangement supposes the pre-existence of theory before the historical method can be applied. Endeavour to avoid the conclusion as we may, we are driven to admit that our science must be founded on theory, call it by what name you will: abstraction, which lies at the root of the deductive, or hypothesis, which forms the basis of the inductive method.

It is remarkable that in the writings of Adam Smith we may find the habits of mind exemplified on which both these schools of thought have based their reasoning. As was well observed by the late Mr. Walter Bagehot, it was precisely this position of Adam Smith which gave him his peculiar usefulness. He fulfilled two functions. On the one hand, he prepared the way for, though he did not found, the abstract science of political economy. In this sense he is the legitimate progenitor of Ricardo and John Stuart Mill. On the other hand, he was also the beginner of a great practical movement, and no man can head a great practical movement without knowledge of the affairs of ordinary life. There are, Mr. Bagehot truly observes, scarcely five consecutive pages in the "*Wealth of Nations*" which do not "contain some " sound and solid observation, important in practice and replete " with common sense. The most experienced men of business " would have been proud of such a fund of just maxims fresh " from the life, and it is wonderful that they should have occurred " to an absent student, apparently buried in books and busied with " abstractions." It is somewhat strange that the opposite qualities as to habit of mind are traceable in David Ricardo. He was the founder of abstract political economy, but his occupations were the reverse of those in which it might have been expected that such modes of thought would be encouraged. He was a shrewd, active man of business, constantly engaged in a very absorbing occupation. It is the fashion rather to decry Ricardo at this moment, but I think that those who desire to advance economic study among us may do well to fortify themselves by a study of his arguments, though they may not be able to accept all his conclusions.

I have endeavoured, in what has been said thus far, to explain the principle of research by which we may hope to extend the bounds of the branch of science which we study, and the habits of thought we should desire to cultivate. We must follow the historical method of research too little recently followed in this country.* We must test economic conclusions by the evidence of

* I should, in passing, refer to Mr. James E. Thorold Rogers's work, "*A History of Agriculture and Prices in England from the Year after the Oxford Parliament, 1259, to the commencement of the Continental War, 1793.*" Vols. i to iv, 1259-1582. Oxford: Printed in the Clarendon Press. London: Oxford University Press Warehouse, 7, Paternoster Row.

facts. But while we thus accept the necessity of following a deductive method, we must bear in mind that it is not opposed to, but can only safely be carried out on the lines marked out by, inductive reasoning. Nor do I, in speaking thus of the historic method, wish to be understood to endorse without reserve the views of the historic school. But though I think in some respects their conclusions are incorrect, I can well believe that research carried out on the historic method, based on sound principles, would be very fruitful in results. It is rather, however, the art than the science of economics which has a hold on the popular mind at this moment. We must not overlook this feeling.

In active, busy, hard-working England we are too much apt to neglect any mode of research from which we do not see immediate, marked, and tangible results. We shall do well to turn this habit of mind, if we can, into the service of economic inquiry. There are several branches of economic study the investigation of which might be useful to our country at the present time. I will venture to indicate two or three of them.

First, it is the opinion of some observers of contemporary events—men competent to form an opinion, from habit of mind and opportunity of observation—that the days of exuberant prosperity to this country—the days in which, to use an expression now historic, prosperity advanced “by leaps and bounds”—are over. I shall not pause now to examine into the grounds upon which this opinion is founded. I do not intend to put it forward in an extreme sense, as if I believed it possible that all the brilliant and luxuriant growth of vigorous power by which we are surrounded is about immediately to pass into the “sere and yellow leaf,” and to fade away at once. But it is, I think, quite possible, without expecting any change as marked as this to come on immediately, that the days when great profits were made by large and important classes in the community may be over. There may be, and there probably are, great inventions yet to be discovered, as great—possibly even greater—than those which have changed the face of this country, which enable it to bear on its surface a population far more numerous and yet, on the whole, more prosperous than has ever yet, at any previous period in our history, been numbered within the four seas. But yet there does seem a pause—perhaps only for the time—in the progress of several branches of industrial labour; and we may be not very remote from, if we are not already entering into, the condition termed by economists the non-progressive state. I do not dread this condition for our country should it arrive. We may, under it, by a judicious adaptation of habits to the circumstances of the case, be powerful, prosperous, and respected by our neighbours. Countries in this

condition have gone on for years in great prosperity, supporting their population in a state of marked comfort. But when they have done so, it has been by a distinct acceptance on the part of the popular mind of obedience to the common virtues of thrift and foresight, which have been too long neglected among us. Here is a practical field of great usefulness for the economic student to occupy. Some have already laboured in it. It will be far better for our population if they can be brought to anticipate what must result from such a state of matters, rather by calm reasoning than by the stern teaching of necessity. This is one point of the application of the art of economics which may be very usefully followed out in a scientific spirit.

There is another position of a most useful character which may well be occupied, which requires knowledge somewhat of a different order. It is remarkable, at the present time, how little foreign economic writers are studied in this country. You may read through the works of more than one recent English writer on economic subjects almost without being aware that there existed any authors dealing with the subject except those who employed the English language. There does exist, however, as I need hardly mention, a very copious and valuable literature, the work of continental scientific writers, which we might do well to explore and to master. Some foreign writers—or at least some of their works—have been translated into English. Thus the very useful “Guide to the Study of Political Economy,” by Dr. Luigi Cossa,* has been translated from Italian into English, and has been published here, with a preface by the late Professor Jevons. Again, the two valuable volumes of the “Principles of Political Economy,”† by Professor Wilhelm Roscher, have been translated into English, and are a welcome addition to our stock of information. This work is rendered, and very ably too, into English. I must confess that it is a matter of some regret to me that this translation has proceeded from an American source. Not that I would grudge my fellow students in the United States the distinction of the work; but I well remember the difficulties which environed a proposed translation in England which I sought to carry out, and that the matter was dropped, those difficulties for the time proving too great to be surmounted. I hope that greater interest in these subjects might be felt now. I think that if some intelligent students of economics in this country would attempt a series of translations from the works of foreign writers not yet

* “Guide to the Study of Political Economy.” By Dr. Luigi Cossa. London: Macmillan and Co.

† “Principles of Political Economy.” By Wilhelm Roscher, Professor of Political Economy at the University of Leipzig. Translated by John J. Lalor, A.M. London: Trübner and Co. Two volumes.

known here, they might do themselves and the science itself a service. Something has been done in this direction, but there is still a wide field to occupy. I may quote, in saying this, a passage very much to the point from Professor Jevons's preface to Dr. Luigi Cossa's "Guide," which I have just mentioned :—

"Every economist would grant that we have in English the works of the father of the science, Adam Smith, and of not a few successors or predecessors who have made the science almost an English science. But this fact, joined perhaps with the common want of linguistic power in English students, has led our economic writers to ignore too much the great works of the French and Italian economists, as well as the invaluable recent treatises of German writers. The survey of the foreign literature of the subject given in this 'Guide' will enable the English student to fix the bearings of the point of knowledge which he has reached, and to estimate the fraction of the ocean of economic literature which he has been able to traverse."

To take a third point. Every successive generation, perhaps almost every decade, is as a rule occupied with some particular branch of economic thought. A short time since free trade was the economic point occupying the thoughts of all. Everything almost was referred to a free trade standard, and was judged accordingly. For a long period, also, there came into prominence the great doctrine of *laissez-faire*. The late Professor Jevons, who joined to vast logical and analytical powers of mind a vigorous common sense, which perceived as it were by intuition that when once an economic doctrine of that class became separated from the sphere of practical application it ran a great risk of becoming entirely vague and indefinite, has done more than any one else to mark out the limits within which that doctrine should be applied. After this the relation of socialism to economic teaching became, and is now, one of the important questions of the day.

The vigorous periodical literature of the time, which has taken the place held by pamphlets to our fathers and grandfathers, supplies a fairly good test of the subjects which occupy the public mind; and it is a proof of the prominence now given to socialism that the numbers published in April last of the "Contemporary Review," the "Fortnightly," and the "Nineteenth Century," all three contained articles bearing on this subject, as did also the July number of "Macmillan's Magazine." Those in the "Contemporary" and the "Fortnightly" were written by M. Emile de Laveleye, the eminent Belgian economist; that in the "Nineteenth Century" was written by the Rev. Samuel A. Barnett, a well-known hard-working clergyman in the east of London. The article in "Macmillan's Magazine" was written by Mr. Fawcett as a chapter in the new edition of his "Manual of Political

"Economy." The views of the subject presented by these writers differ greatly, as may be imagined, from each other. M. de Laveleye presents to us the aspect under which socialism appears on the continent. He admits that the material condition of the population is preferable to what it was in the middle ages, but he looks with great uneasiness to the state of matters in an age in which competition rules everything. General dissatisfaction with his lot is the result, M. de Laveleye thinks, to everyone with a feeling of want of security as to the future. It is not the case that the condition of working men is worse than it was formerly. They have benefited from the greater cheapness of manufactured goods, they are in many places better housed, they are generally better clothed, and their furniture is better. But it is the sight of the inequalities existing in modern life, the loosening of the ties which formerly united class with class, which induces the bitterness of feeling, closely allied with socialism, anarchy, and nihilism, and causes the desire for "the destruction of everything, states and churches, with all their institutions and their laws—religious, political, judicial, financial, educational, or social"—like the "Fifth Monarchy Men" whom we read of during the darkest years of the Commonwealth. Universal destruction is the watchword of this party, that a new world may be built on the ruins.

M. de Laveleye, while commenting on these matters, does not apprehend any immediate danger to the present social order, unless one of those great crises takes place in which there is a general collapse of power, such as occurred after the break-up of the late Empire in France. The world saw then what the deeds of the Commune were. May it be long before such an outburst of crime is witnessed again. But when we consider the existing condition of affairs among the principal nations of Europe, the severe strain of forced military service, the heavy demands on the means of the people to meet the requirements of the crushing debts, national as well as local, the vast budgets, out of proportion to the benefits received therefrom by the people who pay the taxes, and the increasing weakness of administrative power—much as one may regret that such turbulence of spirit exists—one cannot wonder that it should spring up. This is a rough sketch of the view presented by M. de Laveleye.

In our own country these questions usually take a milder form: though I could find expressions of opinion as strong, or nearly as strong, to lay before you as those just quoted. But I prefer to take for my instance the gentler type of opinion as shown in the article by the Rev. Samuel Barnett in the "Nineteenth Century" to which I have referred. England is, perhaps I should say, has been, honourably distinguished as a country in which the "falsehood of extremes" is instinctively felt. We have here no

crushing conscription, no inordinate pressure of taxation. Hitherto we have fortunately escaped these things, and may, by the exercise of common sense, hope to do so in future. Mr. Barnett feels this. His recommendations include a wiser administration of the poor laws, so as to enable a distinction to be drawn between the man who had kept clear of parish relief up to a reasonable age and the man who had not. This, and a wider application of the principle of the Artisans' Dwellings Act and the Libraries Act are amongst the principal of his recommendations. They come to this, that the old age of the honest working man should be made secure against distressing want or degrading relief, and that the power of obtaining rational pleasures should be provided for him within reasonable bounds. Some will think this will be going too far. The question for the economist to consider is, How far can it be granted without impairing the great principle of self-help? This is a point too frequently ignored; but when I consider the condition of many of our working classes, their prospects in this country, and the openings which our colonies and the United States promise to energetic industry, I think we must be prepared to offer better terms than we hitherto have done to those who continue to dwell here.

Legislation, conceived in a somewhat similar spirit, has recently been determined on in the German Empire; and if the iron spirit of Prince Bismarck has felt it needful to yield this concession to popular feeling, it would not seem improbable that other statesmen may have, willingly or otherwise, to travel in the same road.

There are limits, however, to the application of this class of payments by the State which must be borne in mind. And Mr. Fawcett in his article in "*Macmillan's Magazine*," which deals with the thorny subjects of State socialism and the nationalisation of the land, is careful to enforce this warning. The real incentive to labour and economy is individual interest, and we must be careful not to break down the force of that power, the mainspring of progress; nor to lose sight of the great principle previously referred to—which not a little in recent legislation and public feeling has powerfully tended to impair—that self-help is beyond all question and comparison the best help.

I have in these observations only marked out some of the limits of this wide subject. The question how far the principles usually included under the denomination of socialism should or should not be taken into consideration by the State is one which our economists would do well to consider. Economic teaching is sometimes termed hard and cruel by those who do not comprehend its scope, because some of the warnings it gives do not fall in with the sickly slackness of popular sentiment. This is most unjust. Other branches of study are not spoken of in the same manner. The surgeon is not termed cruel because he recommends an operation which,

though painful, is essential to life; because he shows that the neglect of certain precautions will be followed by suffering, perhaps by death. The economist who sees that the happiness of the community can only be secured by causing individuals to submit to restraints which are irksome and perhaps painful, should not be termed cruel for pointing out what is essential to the general well-being. He is, in this, entirely within the scope of his duty. A community which is not prosperous can scarcely possess all the elements essential for happiness.

I have endeavoured to indicate in these remarks both some of the directions in which I think that economists may labour with advantage, and the principles on which their labours should be conducted. Economic science, like all other branches of science, is governed by certain laws. These laws must be adhered to, though it may not be possible to affirm of them that they are always more than relatively true. But the question of relative truth opens the door to a far wider field of inquiry, the threshold of which I must not cross.

If I may for one moment in concluding diverge from the stricter mode of thought which I have sought to follow, I may claim for economic teaching that it is the natural utterance of the most fervent patriotism, and possesses the sanction even of a more serious authority. It was not, we may be sure, without wise deliberation that the authors of the noble English liturgy, following in this older forms of religion, included among its formularies a supplication that the monarch may study to preserve the people in wealth, among other blessings. Without the means of well-founded prosperity there is no permanence for a nation. In listening to or departing from the teachings of economic truth lies the choice between the paths which lead to wealth or to want, to death or to life. Some may say there are higher aims even than these. To them I may quote the words of one of our deepest thinkers—"the virtue of prosperity is temperance, the virtue of adversity is fortitude." It is the glory of economic teaching, while pointing out the methods by which prosperity may be secured, never to lose sight of the principles by which temperance is attained, and temperance is essential to fortitude, able to resist the hasty gusts of popular feeling, able also to warn the powerful when that feeling is well founded.

Ill will it be for England if, in times of movement, this temperance, this more than golden moderation, be not unwaveringly held in mind and observed. Well will it be for her, at such a time, should she follow the counsel of the greatest of living poets—

Not clinging to some ancient saw;
 Not mastered by some modern term;
 Not swift, nor slow to change, but firm;
 And in its season bring the law.

"ECONOMY and TRADE." *The ADDRESS of the PRESIDENT of the DEPARTMENT IV of the NATIONAL ASSOCIATION for the PROMOTION of SOCIAL SCIENCE, held at HUDDERSFIELD in October, 1883.*
By J. E. THOROLD ROGERS, ESQ., M.P.

Some Aspects of Laissez-Faire and Control.

THE doctrine that each individual, being protected from force or fraud, should be left entirely to his own discretion in carrying out his own contracts with others (the term contracts being used in the very widest sense, as implying all relations into which a human being enters with other human beings, or with society), has had a very varied and contradictory history. It may be desirable, as a contribution to the historical method of political economy, that I should on the present occasion try to put before you some of the leading facts in the history of the doctrine, should essay to form an estimate of its present position, should attempt to illustrate the proper sphere of its action, and should suggest some criticisms on its application or non-application in existing practice, custom, or law. In treating this subject, I must ask your patience if I sometimes appear to lay great stress upon what may be called social ethics, and at another time I appeal to matters of fact, and am throughout discursive.

The early history of civilisation shows us that law was easy in permitting contracts, and rigid in enforcing them. So essential was the theory of a contract to social life in those remote ages, that the great historical philosopher of antiquity even treated wrongs as contracts in which force and fraud justified a revision of their incidents. Now it seems that the supreme importance of encouraging contracts led to the easiness with which they were permitted, and to the rigour with which they were enforced. When the Roman law allowed a debtor to enter into a contract for the loan of money or goods, under such terms that he might not only covenant to pay any rate of interest, not only to pledge his property, and his liberty, and that of his family, but even to engage that, failing to satisfy his creditors in full, his own person might be cut in pieces, without the creditors, all and several, running the risk of Shylock, we may be certain that some strong reasons existed for enacting so atrocious a penalty on the breach of an obligation to pay a debt. The explanation is, I believe, to be found in the fact that the sense of the abiding obligation to meet liabilities founded on past advances is the hardest lesson which the individual in an infant

community can learn. It was comparatively easy for primeval man to understand family duties, it was not much more difficult to engender the sense of loyalty to institutions and persons, and to habituate him to tribal customs; but to make him understand that he was bound to meet his contracts with his equals at a period subsequent to that in which he had received and enjoyed an advance, required a very severe discipline, and all the education which positive law could give. And yet it will be plain that the maintenance of contracts is the first step in social civilisation. I may quote by way of illustration how large were the liabilities incurred in England under the Statute of Merchants by those who in the thirteenth century entered into commercial contracts.

The law of debt, then, in early civilisation, is always excessively severe. In course of time this severity is found to have created political dangers, and usury laws, limiting the rate payable for the use of advances, are enacted. Such legal rates of interest are insisted on in some countries, and in default of a special understanding are implied in all. Then comes a time when, for well-known reasons, it is urged that contracts for the use of money should be as free as any other contracts for the purchase of goods, and usury laws are abolished. They are, however, re-established in another form, *i.e.*, a bankruptcy law.

The avowed and first purpose of a bankruptcy law is to secure the equal division of an insolvent's estate between all creditors whose claims are on an equal footing. The secondary purpose is to relieve the debtor of his liabilities, certain conditions being satisfied, and to enable him to earn his discharge. The recognition of the second purpose is practically the same as a usury law. It diminishes the principal of his liability as the usury law does the interest of it, and in theory it makes no difference that the usury law deals with the individual or single contract, the bankruptcy with all contracts, because the occasion on which the relief is given is consequent on the equal distribution of the insolvent's estate. It is clear, too, that the reasoning which was alleged against usury laws can be alleged with equal force against the relief of the bankrupt—the fact, namely, that it hinders the borrower (or debtor) on the pretence of relieving him; for it is quite certain that trade collectively, or the consumers collectively, must bear the burden of the bankrupt's shortcomings, as they paid collectively, in their capacity of consumers, for the legal limitation of the rate of interest. And if it be alleged that persons in high credit were not affected by the usury laws, but only those whose necessities compelled them to borrow, so it may be answered that no amount of bankruptcies would curtail the power of a purchaser whose credit was absolutely unquestioned and unimpeachable.

Our forefathers, again, drew a distinction between the right of the vendor to exact a scarcity price for that, the deficiency and abundance of which depended on purely natural causes, and that which could be interpreted as the reasonable reward or natural price of a service. Thus the English laws did not attempt to fix the price of wheat and malt. These were allowed to fluctuate with the seasons. What they did was, given the price of wheat and malt, to fix the price of the bread and beer manufactured from them, *i.e.*, to determine the rate for which a common or continuous service should be supplied, the labour of the baker or the brewer. Hence the legislators of a bygone time considered themselves entirely justified in fixing the price of labour. The first occasion, it is true, on which they used or tried to use this right was when the supply of labour was affected by precisely the same causes as those which bring about a food scarcity. Of course we may interpret the famous Statute of Labourers as an attempt to keep up farming profits and rents; but it is, I think, more reasonable to conclude that, as the legislature or the executive strove to keep food cheap, by prohibiting exports when prices rose above a particular maximum, and money cheap, by prohibiting the export of the precious metals, and money good, by supervising the importation of foreign coin, so they conceived themselves equally justified in regulating the remuneration of labour. That they were in error in the theories which they held and in the expedients which they adopted may be admitted, as it may be proved, but their theories were consistent and intelligible.

I will take another instance. My hearers are perhaps aware that our forefathers showed a peculiar hostility to any intermediaries in the corn and provision trades, and that they inflicted penalties on those who bought corn on the way to market (the forestaller), and on those who re-sold it in the same market (the regrator). We have long since seen that these callings are innocent and even beneficent. But our ancestors saw that such transactions must imply a profit, or they would not have been undertaken, and they concluded that this profit must enhance the price and induce scarcity. We know that if they do enhance the price—and it is probable or even necessary to infer that they do—if they could be dispensed with, they avert the scarcity which they were supposed to induce. Now, in those times no attempt was made to fix the price of commodities generally, and only of some kinds of labour fixed in commodities or supplied for the ends of the general good. But our forefathers could not understand or even endure the middle-man. Except when he was absolutely unavoidable, *i.e.*, was the export and import merchant, they had and would have nothing to do with him. The whole machinery of internal trade

in ancient England, in its markets and fairs, was to bring producer and consumer into immediate contact with each other, and by facilities of traffic to diminish the extent of cost in the settlement of contracts. I do not believe that, in the thirteenth century, Oxford had more than 3,500 inhabitants, probably less, but there was a regular corn market held there every Wednesday and Friday, and producers and consumers were thus regularly brought into contact with each other twice a week all the year round.

The Englishman, then, five centuries ago limited freedom of contract in the case of the use and exchange of money, of certain kinds of consumable food, and in the price of labour. They also granted charters of incorporation to traders, who were permitted to limit the number of persons engaged in the trade by their bye-laws. Practically, the traders and artisans of the towns in which these incorporations were created resembled the regulated companies of the seventeenth century, in which every one who became, by payment, free of the corporation was allowed to carry on trade at his own discretion. But there was a distinct motive in the gift of their privileges. The object was to secure the quality of the articles sold, to make the guild responsible for the genuineness of the goods and the good faith of the society. In a community where it would not be possible to supply an adequate police, it was something to have secured that the craft or guild should be made answerable, not only for the character of its members, but for the excellence of its work, and the annals of English commerce are full of examples of the process by which this purpose was carried out. It may be that these expedients were certain to be unsuccessful, but it is clear that they were intended to be effective, and that their motive was intelligible. I do not here advert to the restraints and disabilities which were put on certain classes of society. They had an historical origin and meaning, and could always be got over by a moderate effort and a small pecuniary sacrifice.

The hindrances to trade which later generations of law-makers created were of another character. They were intended ostensibly to develop English industry and commerce—the plea on which protectionist arrangements are justified in modern times. But they were more generally defended on a specious and patriotic ground. It was alleged that the restriction prevented the loss of the precious metals by saving the balance of bargains in favour of the English dealer. We now know that this notion is a mere delusion, except as regards the specie reserves of banks. But in the absence of that monetary system with which we are familiar, and with the feeling that a scarcity of money meant low prices and losses, however brought about, it is not wonderful that men

were anxious when they believed that the country was being denuded of its money, and that they knew that money could not be recovered except by forcing sales.

Forty years ago, the advocates of free trade in food and goods were unqualified advocates of *laissez-faire* in all commercial undertakings. They looked, to be sure, suspiciously on labour partnerships, by which I mean what are called trade unions; and they held that it was by free and unrestricted competition only that all industrial and commercial undertakings should be carried on. They held that all persons should be free to contract for services and products, and that restraints on either were part of that unrighteous and selfish interference with perfect commercial freedom, which begins by being sordid, and ends by being suicidal. And yet it is quite clear that from the day on which the final victory of free trade in food was conceded, the free trade in products produced abroad by importation into English markets was allowed or even demanded, and the total abolition of protection on English manufactures was affirmed, the principle of *laissez-faire* was made subject to a series of limitations.

This, indeed, might have been expected. It was only when the English people had learned their industrial strength under the wholesome stimulus of free exchange, that they could also learn how to adequately husband their resources by restraining the waste of them. And I think it can be shown that all interferences with freedom of action or contract, which have stood the test of experience, have had more or less distinctly this aim, and have achieved this result of the restraint of waste.

Let us take the first of these, one which excited a great deal of ill-feeling at the time, for which the mere partisan advocates of the measure are not a little responsible—the Factory Acts, under which the labour of children was to some extent prohibited, to some extent curtailed, and the hours of labour generally shortened. It was alleged that not only was this legislation a serious invasion of freedom, and a mischievous meddling with the opportunities of labour, but that it would seriously handicap the English manufacturer in his competition with the produce of other countries, where no such restraints were imposed, that it would increase cost, lower profits, and depress prices. But none of these results have been traceable in the history of English industry, though of course that industry has had its fluctuations. It has been found that the efficiency of labour is increased by the restriction put on the time during which it could be employed, that abundant compensation could be found for the apparent restraint, and that indirect advantages of a very substantial kind have been derived from the adoption of what seemed to be a perilous experiment. In the

United States the hours of labour in the cotton industries are considerably longer, as I was informed last year; the money wages on the whole are not greater, and the cost of living higher than in England. There is, as might be expected in a new and vast country like the American Union, a far greater range of occupations open to persons, but the opportunity of change is not necessarily a benefit.

The English people has fully made up its mind that the right to lay out one's money to the best advantage in products derived either here or abroad is one which it is a mere paradox to dispute. Producers may hanker after protection, just as they may desire higher profits than they have hitherto had, but consumers are not willing to encounter a real and present loss for an imaginary and distant good. Still, I am convinced that such an experiment as that of the Factory Acts would never have received acquiescence, or have been permanent, unless the previous or concurrent condition of free trade had been granted; for it is clear that every time of lowered profits or trade depression would have been ascribed to the interference with contracts for wages. It is, in short, by emphasising the doctrine of *laissez-faire* on certain intelligible subjects that we are able to discover what those particulars are in which the restraint of law is for the public good.

The occasion for economy in the management of income or wages is withheld, if the opportunity of laying out one's resources to the best advantage is denied. This is illustrated by the attitude taken for a long time to the new poor law. It was held that the maintenance of labour from land, if wages were insufficient, was a perfectly fair bargain; first, when the State, through the agency of the quarter sessions, fixed the rate of wages in all agricultural and mechanical callings; and next, when protective duties were levied on all foreign food, and prohibition was put on some. The two regulations were principally supposed to be in the interest of land-owners and farmers. To fix rates of wages without supplementing their deficiencies was not merely unfair, it was ruinous, and the mischief was exaggerated in times of scarcity. The allowance system, *i.e.*, out-door relief on the most elastic scale, was a necessity. Now it has been often noticed that though the largest contributions to the poor-rate come from the land through the occupier, the policy of levying taxes on occupation, which is our custom, instead of on property, which is the American system, left a very considerable burden on those who did not employ labour with a view to profit, and that the addition to wages made by the allowance system was the indirect payment of such wages from a common fund, while the employment of labour at artificially low rates was a benefit to a limited number of persons, *viz.*, employers. This is

seen practically by the present ratepayers in the east end of London, who, being generally working men, have set their faces resolutely against the modified system of outdoor relief, which is permitted under the present law, in their own district.

In deference to the constant and urgent representations of the economists fifty years ago, and in view of the gradual absorption of rent by the poor-rate, the new poor law was established. It was carried through Parliament, and was at once met by a storm of indignation. I can well remember hearing about the discontent it caused. The poor, it was said, were deprived of their inheritance in the land, the right of maintenance from it. For once in the history of English social life, a system of communism was organised, and, though circumstances were not favourable to its success, a distinct political party was formed by the working men, under the name of Chartism, the ultimate object of which was the reversal of the new poor law. The fact is, this famous law was put first in order of time, when it should have been second. It should have followed, not preceded, the repeal of the taxes on food. The working classes had been indulged with the old poor law as a compensation for the regulation of their wages, and the artificial dearness of their food; for though the old system of regulating wages at quarter sessions and the laws against combination were swept away in 1824, the tradition of regulating them survived, and labour partnerships, though they ceased to be criminal, were not recognised by the law, and were not under its protection. And the proof of what I say lies in the fact that speedily after the repeal of the corn laws, and other taxes on food, though Europe was convulsed by political uprisings from the Volga to the Straits of Gibraltar, and there was hardly a throne which did not totter, the movement in England entirely collapsed, and the hostility to the new poor law rapidly declined. When the news of Louis Philippe's flight reached England, Sir Robert Peel, no mean judge of the dangers which attend a political crisis, passed over the floor of the House of Commons, and said to Mr. Joseph Hume, "This would have happened in England if I had listened any longer to these people," pointing to the protectionists behind him. Men will bear the misfortunes of their lot if they see that they are not studiously aggravated by selfish legislation.

I take it for granted, then, that the doctrine of *laissez-faire* is absolutely settled in the case of all the necessities of life, and most, if not all, its conveniences, whenever the producer is not assisted by law in getting an exceptional price for what he has to sell. The doctrine of *laissez-faire* is absolute in the case of contracts for the use of labour, except in cases where (1) the labour could not be allowed to be sold without serious detriment to the community at

large, the individual, and ultimately to the industry which hires the labour, as in the case of the labour of the young, and in a limited degree of women; (2) when the labourer is put in so disadvantageous a position that he is virtually debarred from making a free contract, as, for instance, when he has been forced to take his wages in a tally-shop, or in a public-house, or under peculiar and preventable causes of danger, or under circumstances where labour partnerships are forbidden, and men are hindered from entering into those arrangements under which they can sell their labour collectively. And I venture on predicting without fear, that under certain acts of legislation, under which the abuses I refer to have been swept away—some a long while ago, some very recently—intelligent and beneficial bargains for the use of labour are far more likely to be freely entered into and honestly kept, than they were under a factitious and unreal appearance of free contract. In matters of trade as well as matters of conduct, it is frequently found that a large measure of freedom can be purchased only by a small measure of restraint, and that by curtailing in appearance individual liberty, its extension and even its reality is secured.

The choice of callings, and the change of callings, under the condition, when trust is to be reposed in the person exercising the calling, of adequate proficiency, is another instance in which the doctrine of *laissez-faire* is affirmed. Of late years it has been extended in the one direction—that of giving freedom of choice, and limited in the other—that of the tests of proficiency, which have been sometimes made actual though previously non-existent and stringent, when they were previously imperfect if not trivial. Historically, indeed, the evidence of proficiency in certain callings is an afterthought, brought forward to justify, and with a great show of reason, a practice which had a different origin. The system of apprenticeship, which affected the law and the church as well as crafts and trades, was intended to restrain competition by limiting numbers; the delay imposed on the apprentice in working profitably for himself, and the expense of fees for admission to the craft, being practical hindrances to over-crowding. The ordinary apprentice served for seven years in workshop or counting-house, the barrister was apprenticed for seven years before he was called, the clerk had to pass seven years at the university before he was entitled to lecture on the learning of the age, and seven years more before he was allowed to teach divinity. But in no case was any other test than delay applied.

Of late years we have admitted all persons to callings without distinction of creed, and the movement demanding the admission of all persons without distinction of sex to employments which women's health will bear, and in which obvious proprieties are not outraged,

has made great progress and attained considerable success. There should be no apology needed for the claim that women should be admitted to practice the medical profession, or to qualify for the function of teachers, especially for the young, with whom their patience and tact are invaluable, or to satisfy the demand for any work which requires neatness, accuracy, and despatch. I am aware of the objections which are taken to the competition of the sexes in the same calling; but experience shows that the aggregate of industry sorts itself best in the interests of all when, certain obvious conditions being satisfied, and precautions taken, the process is left to perfectly free action. We are told that we owe the tortuous absurdities of English conveyancing, which are at once injurious to the public good and discreditable to our patience, to the exclusion of Roman Catholics from the bar, and to a consequent perversion of their ingenuity.

But, on the other hand, the policy of *laissez-faire* is met by increasing demands that adequate evidence should be given of professional competence. The demand is of very late growth, but it is being extended in every direction. Seventy years ago there was no evidence whatever demanded for medical skill, at least in the case of the ordinary practitioner. A few years ago the solicitor and the barrister were admitted to practice without any formal proof that they could even read or write, far less were at all acquainted with the elements of their profession, the only thing demanded of them being, time between introduction to their calling and a licence to practice it. The profession of the bar was the last which required any evidence of general culture, and there is perhaps no other calling in England, eminent members of which, except in the experience of their profession, have been occasionally so profoundly ignorant of all rudiments of learning. But this is all changed. The demands made on the old professions are increasingly exact and large, at least on paper, and the impulse is towards the creation of new professions with special tests of proficiency. This is the case with the art of the dispensing druggist, of the surveyor, of the elementary schoolmaster. Nor do I doubt that the movement will grow. There is a strong impulse, which I do not condemn, on the part of those who belong to a calling, to limit competition in it by restrictions on entering it, and a further opinion that professional trust should be conditioned by professional competence. In course of time these privileges will undoubtedly be accompanied by what is as yet slow and halting, the enforcement of professional responsibility by law, and by the discipline of the calling itself.

In general, persons may put, giving due notice, what price they please on their property or their services. If a trader announces

that he will not sell a picture under a thousand guineas, or a landowner an acre of agricultural land under 1,000*l.*, or a house owner will not let a house under 1,000*l.* a year, or a carpenter will not work under 10*l.* a day, no one would, I presume, interfere to compel him to sell, let, or work, that on which he fixes his price beforehand. Nor do I know of any civilised country which would constrain him not to do any of these things. In the old States, however, of the American Union the public wisely, as I think, takes unoccupied premises at their full value, even though the law in America does not permit the accumulation of land by legal instruments, as we do in England, and so gives the great owner a prodigious power of controlling demand by withholding supply. Where no injury, or at least no recognised injury, is done to the general public, the principle of *laissez-faire* is allowed absolute sway both in commodities and in services.

But where different results are visible, the practice of civilised communities is to control or even repudiate the principle, and to do so increasingly. We do not allow the owners of public conveyances to charge at their discretion. Sometimes we compel those who supply the service to publish their charge and abide by it. Sometimes we fix the price of the service, and constrain all those who enter into the calling to accept the price which the law lays down. Sometimes we fix a maximum price, and allow those who perform the service to lower, but not to exalt it. In all cases the reason of this control is plain enough. The purveyor of the service may be, were he left uncontrolled, so much the master of his customer's position as to extort unreasonable terms from him; to do, in short, what our forefathers thought a usurer, a baker, and a brewer could and would do if their callings were not regulated. In short, we allow absolute freedom in entering into the calling, and put no hindrance of any kind whatever on competition, but we regulate prices. The public might very likely vary the way in which the regulation is established—would do so, I believe, with advantage, if in London the local law of cabmen were made identical with that adopted advantageously in Manchester and Birmingham, but no one would allow the owner of a public conveyance to postpone making his bargain till he has got his customer.

The managers of railways, many of whom are very shrewd men, have invoked the sacred principle of *laissez-faire* in regard to the price which they charge for their services. The case of these adventurers is most peculiar. They claim a sort of patent by Act of Parliament over the district which they traverse, and the probable area which they might serve, resisting energetically any intrusion of a competitive line, and spending vast sums of money in defending their existing interests before committees of

both Houses. The directors and shareholders of the existing companies vote in Parliament against rival lines without pretending to consider the public good. A large and increasing number of persons are asserting that the management of English railways is injurious to English trade, and that it is being sacrificed to special contracts, and made to pay for speculative bargains made with foreign dealers. There is no doubt that the tendency of public opinion is more and more towards making the control of the railway commission effective, and that the Act of last session is only an instalment in the direction of this control; that, in short, *laissez-faire* will be less and less permitted in railway management.

For centuries the occupancy of agricultural land was left to absolutely free bargaining between owner and occupier. It is true that the peculiar social condition of England and the general immobility of farming capital made the competition of occupiers more apparent than real for ages. But the landowner always had one advantage over his tenant, the effect of which has been commented on, and complained of for more than three centuries and a half by every intelligent writer on English agriculture. If a tenant is a good husbandman, and, *à fortiori*, if he improves his holding, it is impossible for him to extricate his capital from his holding without a substantial loss. He is therefore liable, if the alternative of quitting his holding or submitting to a rise in rent is put before him, to a certain loss, the amount of which is measured by (1) the likelihood of his landlord finding a new tenant; (2) the power of his landlord to keep the estate without a tenant; (3) the amount of loss to which the tenant will annually submit. As agriculture becomes more and more a competitive occupation, and therefore one of the parties to the bargain finds himself in a position of advantage, he will assuredly use his advantage. He may, probably will, injure himself in the end, but in the interval he may ruin his tenant, dissociate agricultural skill from agricultural capital, and inflict by the mere exercise of a legal right, interpreted on commercial principles, and perfectly in accordance with the operation of supply and demand, a grave and lasting injury to the national well-being. This complaint, I repeat, has been substantially made for the last three and a half centuries, and has at last led to an active agitation for a more or less drastic legislation, which we are told by several authorities is only the commencement of a very serious agrarian movement.

There is no controversy of a political character as to the statement which I have made. It is admitted on all hands, even by those who insist most strongly on the sacredness of "freedom of contract." The controversy is as to the remedy, on which I do

not pretend to enter. But it may be worth while to put the facts into a concrete form. A tenant cultivating land in a satisfactory manner holds, say, a farm of 200 acres, on which he employs 2,000*l.* capital, this being the sum which he had when his tenancy commenced. If his tenancy is determined he cannot recover more than 1,800*l.* of that with which he started, and his landlord, or his landlord's agent, knows this as well as he does, or better. His rental is 30*s.* an acre, or 300*l.* Now, if he be told that he must pay 1*s.* 6*d.* an acre more, his rent will be raised 15*l.* a year. If he refuses to pay this, and quits, he loses 200*l.*; if he stays, he pays 5 per cent. interest on 300*l.*, and in nine cases out of ten he would rather pay the annual charge than lose the capital sum. If he lays out 500*l.* on improving his farm, his loss is still greater, for this will be a total additional loss. The legislature has corrected the latter contingency, and on very broad grounds, but has found it as yet impossible to grapple with the former difficulty. But it has insisted on putting the occupancy of land out of the category of contracts entered into on the strict *laissez-faire* principle.

A question quite as serious as that of the occupancy of land is that of housing the poorer inhabitants of large towns. The legislature has taken certain steps, and will doubtlessly take more vigorous steps, to deal with the situation. *Primâ-facie*, there is no more reason why the law should help a man to find a home than to find him employment, wages, food, and clothing. But none the less is the legislature going beyond the limits of that *laissez-faire* which, years ago, economists treated as the universal solvent of social difficulties and social problems.

Two causes tend to raise the costs of building in large towns. One of these is the value of proximity to the centres of business. The other is the enhancement which artificial restraints on alienation induce on values. The first of these causes can be modified by no action of legislature, unless we are to re-affirm the old theory of the allowance system in the housing of the poor. It is possible for the legislature, regardless of cost to the general taxpayer, to purchase sites at any price, to erect habitations, and to let them to tenants, regardless of any appreciable return on the outlay. And it must be admitted that, under Sir Richard Cross's Act, this was done. The Metropolitan Board of Works was instructed to buy buildings which should have been condemned as unfit for human habitation, and to pay prices for the sites, including a premium for the compulsory sale, which exceeded in amount what would have been paid for the costliest mansions in Berkeley or St. James's Square. Such a law, after the first experiments, it was impossible to carry on. Even when sites are purchased at reasonable rates, that is, at no value for the

discreditable buildings, and no premium on the sale of such property, the price is still so large that it is impossible to put up cheap tenements, and all that they who are called on to carry out the plan can hope is, that the frontage of new streets will repay part of the outlay in the rental of shop property, a class of tenement which is apt to be greatly in excess of the demand, and to be therefore at a reserved price, slowly disposed of.

The other cause operates in many ways. If a person owns a very large amount of building land in a town, and the law permits him to protect it from alienation, he has plainly a great power, by withholding it from the market, of controlling the price. If a number of persons are in the same position, they may, by a tacit understanding, exact famine prices for what they have to sell. If corporations are allowed to hold land in towns, and try to do the best for the land which they administer, they are certain to follow the tactics of the great proprietor. If the law further puts all the local charges on the occupier, and none directly on the owner, the policy of withholding land from occupancy, until the owner can get his price, has the further stimulus of complete protection from any other loss than that of interest. And when in addition there is added to all these obstacles, that the owner can use his control over demand in order to constrain the outlay of capital on a terminable tenure, and can therefore compel the occupying builders to add a sinking fund to the rent, it is manifest that the market price of land in towns may be forced up to a very great amount in excess of its natural value, by which I mean the price at which it would be sold if none of those hindrances were artificially induced upon its distribution. And though in several large towns all these causes do not operate concurrently, some always operate, and in London they all do with intensity.

Now, I am far from saying that if these causes of artificial dearness were extinguished, sites would be cheapened and rents would fall. House rent is dear in Paris and New York, well-nigh as dear as in London, and there are no settlements of land in either city, and in the latter the owner, not the occupier, pays local taxation. Still the geographical position of New York, and its extremely narrow length, put it out of comparison with London, which is on all sides capable of indefinite extension, while Paris is far less conveniently supplied with the means of communication than London is. But I am not concerned with what the facts might be in case these artificial restraints on alienation were removed. They exist, they are known, they are believed to be allowed, in order to enhance prices: and as freedom of purchase is limited by law, the impression gets current and gets strong, that law is bound to counteract that which law has permitted to be

done. It seems to me manifest that the growing strength of public opinion, perhaps of the public conscience, will enforce the proper housing of the poor in large cities. But the solution of the problem not only involves the entire abandonment of *laissez-faire*, but the very opposite principle, of the State supplying the necessities of life.

Now let me take another instance. Twenty years ago, or a little more, the only control which the law exercised over houses of public entertainment, whose principal occupation and profit consisted in the sale of intoxicants, was that of punishing the owners or lessees for permitting their houses to be receiving-houses for thieves and other bad characters, and not even this unless the facts were forced on the notice of the law. Latterly, however, a powerful and growing party has sprung up, which insists that it is impossible to draw a line between the use and the abuse of stimulants, at least when they are sold for immediate consumption, and threatens the suppression of the trade. The persons who argue in this way have been very successful in shortening the hours of temptation, and limiting the number of days on which the temptation is offered, but have been even more successful in winning persons to their cause, and so, apart from all legislation, materially weakening that which they seek to overthrow. Now, at all times restraints have been put on the abuse of places of public entertainment, but there is a great and growing disposition to extinguish the possibility of their use, and to declare that absolutely unlawful which law has hitherto affirmed to be noxious only in its abuse. But I do not remember to have seen this interference defended on the only ground on which an economist could defend it, that the law has wisely determined to relieve destitution under certain conditions; and as society must, unless it took exceedingly harsh measures, against which man's moral sense and humanity itself would revolt, inevitably pay the expenses imposed by law and crime; and as drunkenness is the cause of most poverty and a large percentage of crime, the control of these causes is a reasonable measure of self-defence on the part of society. The advocates of control take other, perhaps higher, grounds. They allege that the thing itself is radically mischievous, and that it is our duty to save our own people from the consequences of that which is noxious under all circumstances, and destructive in many.

I have referred to instances in our own country, in which the habit of independent and combined action of a voluntary kind has been sanctioned by long experience, and has been encouraged by successful results. Even in this country we find a growing disposition to extend the sphere of positive law, which means, in the

first instance at least, restraint on liberty, or, as the economists call it, innocent *laissez-faire*. In all the cases which I have quoted it is alleged that the power which was believed to be innocent has been found to be mischievous, because capable of abuse, and that not only because it has aided the strong against the weak, but because it has aided the strong against the weakest of all forces—unprotected society. I have spoken mainly of the correctives which modern practice has adopted against the action of individuals and bodies acting as individuals, by curtailing their action. It remains that I should say a little on the cases in which Government and Parliament are urged to take the initiative in action. These are either in the substitution of existing forces, or in the development of new agencies.

Of late years, municipalities have, with almost invariable success, taken commercial undertakings of a simple and regular kind out of the hands of private companies, and performed the operation themselves for that public whose affairs they administer. They have done the business better and cheaper. They have lightened local taxation by infinitesimal octroi duties, these being little in excess of the profits of trade, if as much. They have immeasurably improved the tone of municipal government. In no case which has come to my knowledge, has there been any suspicion of malversation in the administration of the business, and there has been much evidence of an adroit and farseeing business capacity being introduced into municipal life and practice. I do not wonder that public men of great experience and intelligence advocate the extension of far more delicate and disputed functions to an official system which has done so well; of conferring on corporate and elective bodies large powers of police control in their local affairs, and even some of the functions of Parliament. Members of this association are well aware of how hotly these powers are contested, and how watchful they are who are on the alert and vigilant for personal liberty, against the extension of municipal authority. It will be remembered how warmly the powers which municipalities have gained and sought, for securing the notification of infectious diseases, have been resented.

When peril of plague is near a community, a local administration, with or without the authority of law, takes quarantine precautions against the extension of the calamity. I am not aware that there was a single law on the statute-book which directed the restraints by which our ancestors attempted to arrest the progress of the famous pestilence which desolated England at intervals between 1348 and 1665. When the visitation came the power was assumed. Latterly the legislature has formulated the right of municipal authorities to constitute boards and officers of health in

town and country districts, to anticipate pestilence by the adoption of sanitary measures, by precautionary restraints, and even by serious penalties on disobedience. I do not find that this delegation of private duty to municipal authority has been met by resistance or discontent. It has indeed been criticised by a school of writers who believe that the individual weakens his personality by being governed, and runs the risk of losing it by being over-governed. But great hostility has been exhibited against other precautionary measures, of a local or general character, and it is alleged that the general powers for enforcing sanitary conditions are sufficient remedies, without having recourse to restrictions which curtail individual liberty. I mention this, merely to point out that the problem is not always solved by legislation, and that there always will be a contest as to what are the true boundaries of liberty and control.

In order to satisfy the exigencies of health, and to supply the economies of supply in divers municipal undertakings, governments have empowered municipal authorities to anticipate revenue by loans, though they have not, generally at least, insisted that these loans should be gradually extinguished by the simultaneous creation of a sinking fund. Thus the country has created a large internal debt, the incidence of which is frequently a severe burden on the locality, and forms a tax on profits or a charge on consumption, as it happens to be distributed, because here again the practice of levying taxation on occupancy is a direct obstacle to the distribution of land, since the ground landlord escapes all which the occupier is constrained to contribute. But as the several corporations have been invited, nay compelled, to pledge the earnings of the future, so the greatest corporation, the State, is assailed on all sides for advances. In theory the House of Commons is a check on the expenditure of Government. In practice the Government is a check on the demand for public money by the House of Commons, or by the representatives of such interests as make claims there. It was only the other day that one of the ministers of the Crown stated that if the Government agreed to the proposals made for expenditure on behalf of this or that interest, the necessities of the revenue would be greatly increased, and new sources of taxation would have to be discovered. In other words, the executive is constantly encouraged to substitute Government grants and Government supervision for the old doctrine of *laissez-faire*.

Where it is impossible that the efforts of private persons, either individually or by joint enterprise, can effect something of plain and urgent public importance, Government should intervene. Such an incapacity may depend on the nature of the people, or on

the nature of the case. I believe that even in so obvious a convenience as the construction of railroads, the United Kingdom and the United States are the only countries where private enterprise has been entirely sufficient for carrying out the projects, and that in any other country the State has either partly or wholly constructed these works. Latterly, however, the Government has been urged to grant subventions to such undertakings or analogous ones. In the last session of Parliament it assisted, for instance, in deference to urgent representations, Irish tramways and Welsh education. That both these were good ends I do not deny; that they were justified by the circumstances in each case I am ready to admit, but they are none the less a new departure. In England the development of the higher education and the stimulus given to the managers of ancient endowments have been entirely the work of private enterprise, of foundations like Marlborough, Clifton, Cheltenham, of the spontaneous action of the two ancient universities, and the rivalry which they have engendered.

Of late years the State has undertaken in part to fulfil a gigantic and costly duty, the education of the people in national and other schools. Few persons grudge this growing expenditure. It is alleged, and with much reason, that it is in the best sense productive and protective, that it guarantees the continuity of our industrial reputation, that it obviates the risk of rivalry from without, that it gives obscure merit the chance of a career, and is certain ultimately to elevate and refine the morals and the manners of the people. These anticipations are reasonable, and as far as the experience of other countries goes, are highly probable. The prospect that they may be fulfilled would justify the State in taking national education out of the hands of private enterprise, and of making it a matter of public expenditure. I go personally further in this matter than many. In my opinion national education should be entirely free and without charge to the parent, as it is in the eastern States of the American Union. My reason is that it is of no material or economical benefit to the recipient. By feeding, clothing, and housing his children, a parent renders them able to earn their living. He also gives them or gets for them a special training for the industry they must needs follow. But elementary education, if it be universally accorded, will not add a penny to wages, or create an hour's demand for labour. The restraint of children from work, not because such work would weaken their health, but because their time must be given to learning, straitens the means of poorer parents, already narrow, and the cost of education still further reduces them.

Though the taxation for school purposes is relatively light, its addition to the burdens of occupancy, and its occasional unfair

incidence, have made it a grievance. I am persuaded that a large part of the cost of national education could be and should be borne out of the proceeds of obsolete, useless, and demoralising charities. If this revenue were deficient, there remain the funds of ancient institutions, which, without exception, were founded for the education of the poor. In the times before the Reformation, the duty of educating the poor devolved on the monasteries, and was performed to an extent which history has forgotten in its narrative of splendid trivialities. After the Reformation, the recipients of abbey lands were charged with the duty of supplying the education which had been suspended by the extinction of these institutions. Hundreds of schools were therefore founded, generally by Act of Parliament, not as an act of piety and benevolence, but as the tardy and grudging satisfaction of a contract entered into between the vendor and the purchaser of property. These schools have gradually become the property of the rich; and the poor, to whom national education ought, in my opinion, to be a pure gift, are deprived of their rightful and lawful inheritance. Now, a special education is a matter of private advantage, and should be obtained at private charges. We invert the principle in England.

In one particular we have introduced the principle of *laissez-faire* or individual competition into our system of national education. I refer to the payment-by-results method, the invention, I believe, of Lord Sherbrooke. Habit familiarises us with what is, if it comes to be examined on principle, and by its consequences, as grotesque as it is mischievous. That persons should be admitted by selection to offices of trust and value, that the standard of professional competency should be constantly raised, and that the unworthy should be rigorously excluded, I can readily admit. In the public school and in the university this system of selection must be increasingly strict. It is obvious that in this manner boys are, so to speak, sorted into their different callings. But to make the very life of a school, *i.e.*, the funds by which its teachers are paid and its efficiency is secured, depend upon pressing every child through a certain standard, is a strain which no system should be put to, and to which children should not be subjected. It is turning a system of examination, a poor method after all, and one which is commended to us not by the highest estimate of human nature, but by a painful consciousness of its partiality and unfairness, into an instrument of torture. In the conversations which I have had with Mr. Heller, the very intelligent and judicious Secretary of the National Union of Elementary Teachers, and now a member of the London School Board, I have been struck with the direct and indirect mischiefs which this system of forcing a uniform standard on all minds has done and is doing to

pupils and teachers. You have latterly seen that the London School Board has detected and severely criticised certain practices of schoolmasters, and how the gravest suspicion was aroused about the practice of one master, whose pupils were conspicuous for answering questions and earning grants. The marvel is that such scandals are not recurrent and universal. A system which calls imperatively for cram will stimulate fraud, just as a vicious code of revenue laws explains, if it does not excuse, the professional smuggler.

As far as regards elementary education, the American natives of the eastern States are probably the most highly and fully taught people in the world. Their children do not earn grants, are not put under an army of inspectors, not drilled by periodical examinations. The funds for the school are provided by a tax on all kinds of property, the balances of a banker, the stock of a merchant, the pictures, furniture, and plate of a capitalist, the acres of a peasant farmer, and the tenement of the town labourer contributing rateably to the fund. The education is free, of right, for all have paid for it. The management is in the hands of those whom the people can trust, and who prove themselves trustworthy. There is no institution which an American speaks of so fondly, guards so jealously, and praises more proudly than the public school. You may go into them and see the children of the most opulent citizens learning at the same desk with those of the poorest labourers. All learn good manners, and none lose self-respect.

It is not possible, I may say in conclusion, to define the precise limit at which *laissez-faire* ends, and the action of government, parliamentary or municipal, begins. The efficiency of spontaneous and independent action varies with the subject, the community, perhaps the age. There are occasions on which the action of government may be defended on those grounds which illustrate the great economic principle of the division of employments. There are cases in which the interference of authority has first been welcomed, and then decisively repudiated. There are others in which private enterprise has been found to be wanting in thoroughness and economy. But the principle which guides civilised men should be, not to surrender individual liberty, except for good cause shown, and only when proof is given that liberty will gain far more in other directions than it loses in what it has yielded.

The term "STATISTICS." Translated from a WORK by DR. V. JOHN, Professor of the University of Berne, entitled "*Der Name 'Statistik'—Eine Etymologisch-historische Skizze.*" Berne: Verlag von K. J. WEISS, 1883.

MILL says, "We should study *names* before *things*; but it may be "objected that the meaning of names can guide us at most only "to the opinions, possibly the foolish and groundless opinions, "which mankind have formed concerning things, and that as the "object of philosophy is truth and not opinion, the philosopher "should dismiss words and look into things themselves to ascertain "what questions can be asked and answered in regard to them. "This advice, which fortunately no one has it in his power to "follow, is in reality an exhortation to discard the whole fruits "of the labours of his predecessors, and regard himself as if he "were the only person who had ever turned an enquiring eye "upon nature. What does our own personal knowledge of things "amount to after subtracting all that one has acquired by means "of the words of other people?"

The term "statistik" has been discussed at great length by many scientific writers, and so conflicting have been the opinions expressed as to its actual meaning and derivation, that Mohl calls it a psychological curiosity, and Fallati asserts that the word is open to many varying interpretations and definitions. Looking at the actual science which this term represents, if we accept Fallati's theory, it may be taken as evidence of the rapid progress which has been made in the science itself, as each of the definitions represents a degree of development; "For the main purpose of scientific "definitions, whether they are definitions of scientific terms or of "common terms used in a scientific sense, is to serve as a landmark "of classification; and since the classifications in any science are "continually modified as scientific knowledge advances, the definitions in the science are also constantly varying."

For the most part, however, it may be said that no particular importance need be attached to the varying interpretation of the word "statistik;" of scientific interest only is the historical change which has taken place in its original meaning; as Mill says, "A "technical term invented for the purposes of art or science, has "from the first the connotation given to it by its inventor, and "retains this connotation as long as the art or science remains."

Among the many curious meanings which have been given to

the term, we may cite the following of Peuchet in his "Statistique Élémentaire de la France." (Paris, 1805): "This term has only come into general use within the last few years, and may be derived from the word *statera*, a balance, for the reason that statistics weigh and measure the producing power and wealth of a country, comparing it with its previous position, or with other countries; or again, as some assert, it may be derived from the Latin word *status*, as the science shows the condition of a State and its actual position; or again, it may be of German origin, and taken from the word *Staat*, signifying the same as the English *State*, or body of men existing together in social union, as those who first made use of the term 'statistik,' employed it to signify the examination and analysis of the production, wealth, &c., of a town or State."

The German statisticians were for the most part inclined to the opinion that the word was of Latin origin, and derived from *status*, though Hassall in his "Lehrbuch der Statistik" (1822) expressed an opinion that the same should be combined with the Greek ἀριθμητική written by him, ἀρίτμετική, to arrive at the actual term "statistik," and this view is shared by Schubert in his "Handbuch der Statistik" (1835). He says that the terms "statistik," "diplomatic," "heraldic," are all used to express separate and distinct branches of knowledge; while Jonak, in his "Theorie der Statistik" (1856), observes: "According to its etymology, the term 'statistik' is derived from the Latin *status*, this word having the same meaning as the German *Zustand*, which signifies *condition*; or it may be taken as meaning *Staat* or *State*, so that the term 'statistik' actually means a knowledge of the *State*, or body of men existing together in social union, or a knowledge of the *condition*." The conflicting opinions which were expressed as to the true definition of the word led at last to the determination to combine the two general meanings, and thus "statistik" came to denote the *science of the condition of a State*. This rendering was accepted by Butte, who says, on p. 158 of his "Statistik als Wissenschaft" (1808): "According to its derivation it is a branch of learning (*disciplin*) which treats of the *condition of the State*."

Kniess, in his work entitled "Die Statistik als Selbstständige Wissenschaft," forcibly protested against this acceptance, and says: "Granted that the word is of Latin origin, and derived from *status*, signifying *state* or *condition*, either the former or the latter meaning must be taken, as in no case could it mean both at the same time."

Rümelin takes up the consideration of this vexed question, and deals with it as follows: "The word *status*, *état*, *state*, neither means

"state (*Staat*) nor condition (*Zustand*), but 'position'" (*Standt*), from the Latin *sto, stare*. By position we are to understand that particular point in a path on which a body is moving, and in which it is situated at the time of our observation, in the same way as we speak of the position of the sun, the position of a law suit, &c. By the word "condition," however, we should not speak of any movement nor any relation of one body to another, but only as a quality or property which determines the nature of a thing, an attribute or accident in a logical sense. Additional light was thrown on the meaning of the word by Wappaeus, in his "*Allgemeiner Bevölkerungsstatistik*" (1859-61). After the publication of his work the term "*statistik*," using it in Gottfried Achenwall's sense, came to be more generally used. Gottfried Achenwall was professor of law and politics at Göttingen from 1749 to 1776, and he is regarded as the very father of statistics, though neither the name itself, nor the science it represents, really owe their origin to him, for as early as the year 1672 there appeared a work entitled "*Microscopium Statisticum*," written by Helenus Politanus; in 1675 P. A. Oldenburger published his "*Itinerarium Germaniæ Politicum*;" and in 1701 Thurmann issued his "*Bibliotheca Statistica*."

The first account which we have of any instruction being given in the particular branch of learning to which the name "*statistik*" had been given appears to have been on the 20th November, 1660, at Helmstädt, in the University of Brunswick, a course of lectures being delivered by the learned Hermann Conring under the title of "*Notitia rerum politicarum nostri ævi celeberrimarum*." The example of delivering university lectures on this science was speedily followed at all the German Universities, and we find that the learned professor of history and law, Martin Schmeitzel, lectured on the subject at intervals during the period comprised between 1723 and 1731 at Jena, and continued to teach it at Halle until 1747. So it is evident that the credit of giving the name to the science it represented cannot entirely be Achenwall's; in fact Achenwall himself did not lay claim to it, as in his "*Habilitations Dissertation*," dated the 7th September, 1748, he speaks of Hermann Conring as *parens notitiæ rerum publicarum in academiis tractandæ*, and in the same work he modestly assigns to himself the last place in a list of distinguished names, comprising, among others, Meibom, Gundling, Struve, Spener, Otto, Köhler, Schmauss, Hofmann, Bude, Schmeitzel, *aliorumque celeberrimorum virorum*, and who were all distinguished successors of Conring, and who had studied and expounded this *pulcherrima disciplina*, as he termed it, before him. In this work, of which the full title was "*Notitiam rerum publicarum academiis vindicatum, consentiente ordine philosophorum amplissimo, præses Gottfried Achenwall, pro loco in facul-*

"tate philosophicâ obtinendo, ad diem vii Septembris, MDCCXLVIII
 "disputatione publica defeudet respondente Joanne Justo Henne.
 "Göttinga," Achenwall speaks of the science, not in the words of
 Schmeitzel, whose pupil he had been at the high school of Halle
 in 1741, as we find from his diary, but gives it Conring's title,
Notitiæ rerum publicarum.

It was only later that he added the words *vulgo statistica*, as we
 find from Wappaeus's "Introduction to the Study of Statistics,"
 which was published in 1781. On the title page of the first edition of
 Achenwall's work, "Abriss der Staatswissenschaft der Europäischen
 "Reiche," the word "statistik" does not appear, while all the
 subsequent editions, including the sixth, which was published in
 1781 by Schlözer and Sprengel, bear the title "Staatsverfassung
 "der heutigen vornehmsten Europäischen Reiche und Völker,"
 this title following very closely Conring's *res publicæ nostri ævi
 celeberrimæ*. By the term "Staatsverfassung" must be under-
 stood the judicial, financial, and agricultural condition of the
 various States, as Achenwall remarks in his preface.

It is evident that the terms "statistik" and "statistical" must
 have both been familiar to Achenwall, as in the preface to the first
 edition of the work to which we have alluded, and which bears the
 date of April, 1749, he calls his "Abriss der Staatswissenschaft"
 "a guide to statistical studies." Again, on his arrival at Göttingen,
 he spoke of the system on which he proposed to treat the questions
 affecting the extent, limits, subdivisions, and natural relations of
 States and their constitution, as "a preparation for statistics." In
 the preface of a later edition of his work he gave as his reason for
 altering his title, that the word "Staatswissenschaft" really signified
 the "science of government," and as his work was intended to deal
 with the actual condition of a State under all its aspects, territorial,
 educational, industrial, commercial, and financial, the better term
 to employ would be "statistik." This is clearly shown in a
 manuscript which, among many others, was left as a legacy by
 Achenwall to the University of Göttingen. In this manuscript,
 which bore the inscription "Anfang der Vorbereitung zur Statistik,"
 and headed, "An etymological argument," the following passage
 occurs: "The word 'statistik' does not owe its derivation to the
 "German word 'Staat,' but is taken from the Italian 'ragione di
 " 'stato,' unde barbarum voc. latinum effectum ratio status;—disciplina
 " de ratione status, which was taken by practical politicians to mean
 " a knowledge of the State and its constitution; and further, from
 " ragione di stato the Italians first coined the word 'statista,'
 " meaning the same as the French 'homme d'état,' and the
 " English 'statesman.'" Again in another place he says, "statistik—
 " a term not new, derived from *ragione di stato*."

It is well known that towards the end of the middle ages practical politics as well as arts experienced their *renaissance*, and they were denoted by the term *ragione di stato*, from which was taken the "*ratio*" "*status*" so frequently used in the Latin treatises of those days, or by the term *disciplina de ratione status*, which again was contracted into *disciplina de statu*. In like manner the word *status* was used instead of *respublica*, *civitas*, *imperium*. As an example of the many curious explanations given by Achenwall's successors of the derivation of the words "Staat" and "Stand," we may quote the following passage in Butte's work entitled "Statistik als Wissenschaft" (1802): "The word 'Staat' owes its derivation to the 'Persian 'stathma,' a resting place for the sovereign on his 'journeys. The word 'Stand,' however, originates from the old German *Notsstallon* or *Notstatton*, signifying one who is necessary 'for the maintenance of order in a State or district!'"

That the word "statista," as derived from *ragione di stato* was in very general use at this period in connection with those "versed in the science of government," there is abundant evidence to prove; for example, the following passage occurs in the fifth act of Shakespeare's "Hamlet:"—

"I once did hold it as our *Statists* do
A business to write fair, and laboured much
How to forget that learning."

and again, in the second act of "Cymbeline"—

Posthumous to Philario. "I do believe
(*Statist* though I am none, nor like to be)
That this will prove a war."

and in Webster's "Appins and Virginia," the following is found:—

"To you the *Statists* of long flourishing Rome."

In Germany, Philander von Sittewald, in his "Somnium "Itinerarium Historico Politicum," published at Frankfort in 1649, says, "You are a *statist*, and have studied the interest of rulers;" and in the work to which we have already alluded, Oldenburger's "Itinerarium," on p. 824, the eminent statesman Veit Ludwig von Seckendorf is styled "egregius *statista* Christianus." It may be mentioned here that at the International Statistical Congress which was held in London in 1860, the suggestion which was made on the part of the English delegates to substitute for the term "statistician" then in vogue, the old name "statist," did not receive the unanimous approval of the other representatives.

Everything points to the soundness of Achenwall's views in insisting upon the adoption of the word "statista." From this came the Latin adjective "statisticus," and from this the distin-

guishing title "disciplina politico statistica," soon abbreviated into "statistik," was applied to that branch of learning (*disciplin*) which, to use the words of a distinguished authority on all statistical matters, "is an indispensable adjunct of so many sciences, and particularly of that which deals with the condition and progress of society." As Achenwall observes, "it is not only useful, but indispensable, not only to those who care to study the practical bearings of the facts of history and geography on the conditions of man, but also to the legislator and the political economist, whom it supplies with facts on which to base their arguments and from which to draw their inferences. It is especially useful to those who desire to know the extent to which trade and commerce is carried on; to those who travel in foreign countries and who desire to gauge the relative importance of the countries through which they pass, and it is, above all, necessary to those who are entrusted with the negotiations of international treaties."

In spite of the fact that Schlözer—one of the most distinguished followers and disciples of Achenwall—denounced the use of this term "statistik," which he calls a *vox hybrida*, "neither Latin, German, nor French," and recommended in its place the adoption of the word "Staatskunde," or, "Staatenkunde," which really "signifies State science," this *vox hybrida* has been universally adopted, and is now in use throughout the whole civilised world.

As an illustration of the description of miscellaneous information contained in a volume devoted to "statistics," using the word in Achenwall's sense, we cannot do better than call attention to the contents of a volume entitled "Statistique de la France," by Maurice Block, published in the year 1860, and which was a *résumé* of the voluminous official publication, "La Statistique Générale de la France." In that part relating to questions affecting the acreage and production of crops, the author gives in the first volume a detailed account of the best geographical works and charts; he enters into a minute description of the character of the country and extent of surface; of the abundance or scarcity of water; the degree of heat or cold, dryness or humidity; and even goes so far as to give an interesting account of the fauna and flora of France, a subject to which M. Block appears to have devoted some careful attention. He tells us how scarce fruit trees originally were in France, and traces the history of their growth and cultivation; we are informed that the truffle is found in Angoulême and Perigord; that the cherry tree was originally introduced into France by the Romans, the vine by the Emperor Probus; that the raspberry came from Mount Ida, the Indian cress from Peru, the tomato from Mexico, parsley from Sardinia, and a variety of other interesting

and valuable information, which at the present day no one would expect to find in a statistical publication.

Neither Conring nor Achenwall appeared to have devoted so much attention to these matters of minor importance, as they considered them, as their successors, in fact the latter remarks that he modelled his "*Res publicæ nostri ævi celeberrimæ*" on Aristotle's chief work, and Zenophon's "*State of the Athenians*," and Achenwall confines his review of the agricultural production in his work entitled "*Plenty and Want*," strictly to an account of the actual productions of the country, without for example going into any details as to the origin of the various roots and crops.

About the same time that Conring published at Helmstædt his "*Programma*," dated 20th November, 1660, a work bearing the title, "*Natural and Political Observations upon the Bills of Mortality*" was issued by Captain J. Graunt, and presented to the Royal Society of London. In this work it was stated, among other information, that the two sexes were almost numerically equal, the basis on which Captain Graunt founded his observations being the London Bills of Mortality from the year 1593, and the registers of births for the period comprised between 1629 and 1661. The result of his observations was the opinion expressed by him, and repeated up to Oettingen's time, that "*monogamy was a divine institution.*" Captain Graunt also established the fact that male births are continually in excess of female births, and demonstrated that the proportion of male to female children annually born is in the ratio of 14 to 13. He tells us that the decrease of the population caused by the ravages made by the Great Plague of London was counterbalanced by the large influx of persons migrating from the provinces to settle in London; that the "*opinion of plagues accompanying the entrance of kings is false and seditious*;" that the effects of wars upon the population did not exercise any perceptible influence upon the proportion of the sexes; that the city of London was steadily spreading westward; that there was always a sufficiency of men to maintain the English army and navy in a state of efficiency, and a variety of other information on the subject of the movement of the population. The author, speaking of himself, says, though not an educated man, and depending mainly upon the "*mathematics of his shop arithmetic*," he hopes that the facts which he had drawn attention to, and which had hitherto escaped the notice of scientific writers, would receive a favourable reception at the hands of the public. His desire was to inaugurate a new branch of political science, and to provide the practical politician with certain facts indispensable to good government. These observations were ordered to be printed

by the Royal Society in 1665, and Graunt was afterwards elected a member of this distinguished body.

Knapp, from whose "Theorie des Bevölkerungswechsels" (1874) the above facts have been taken, as it was impossible to obtain a copy of the original publication, tells us that Graunt had also devoted considerable time and careful study to the question of mortality, and had even formed a very clear estimate of the proportion of deaths to births, the ages at which deaths occurred, &c.; and this is the more remarkable when we consider how little reliable data there existed at that time on which to form any conclusions, as the bills of mortality upon which he chiefly relied for his information did not distinguish the deaths according to age. He stated as the result of his observations that the proportion of children dying before the expiration of their sixth year was in the ratio of 36 per cent., and with this slender basis to work upon, he founded his conclusions as to the mortality in the more advanced ages, arranging these ages in decennial sections.

In the year 1702, with the object of calling attention to the great benefits which would be derived throughout the whole of Germany by the publication of similar registers of deaths, a German translation of Graunt's work was issued, entitled "Natural and Political Review of the Bills of Mortality of London; its Government, Religion, Extension, Commerce, Climate, Hygiene, &c., by J. Graunt, Fellow of the Royal Society; translated for the benefit of the German nation." The honour of laying the foundation stone of the systematic examination of the social condition of the State, its progress in civilisation, and its natural resources, and the determination of the nature and forces of the various circumstances in the history and condition of a people that assist in forming their character—a science which afterwards received the name of "statistics"—may be considered to be in great measure due to Graunt for his "Natural and Political Review of the Bills of Mortality."

Graunt found a worthy successor in continuing his investigations in the science of Political Arithmetic, as it was then termed. in Sir William Petty, who was a man of great literary attainment, a friend of Hobbes, and a fellow of the Royal Society, and, according to Roscher, justly admired by his contemporaries. In fact, Petty may be looked upon as the first theorist of the new science. In the preface to his chief work, entitled "Essays in Political Arithmetic," dated 1679, he says, "The method I take to do this is not yet very usual, for instead of using only comparative and superlative words and intellectual arguments, I have taken the course (as a specimen of the political

"arithmetic I have long aimed at) to express myself in terms of "*number, weight, or measure*; to use only arguments of sense, and "to consider only such causes as have visible foundations in nature, "leaving those that depend upon the mutable minds, opinions, "appetites, and passions of particular men to the consideration of "others;" and on p. 98 of his "Several Essays" he says, "I intend "to express myself in terms of number, weight, or measure, to use "only arguments of sense, and to consider only such causes as have "visible foundation in nature; observations which, if they are "not already true, certain, and evident, yet may be made so by "sovereign power." The essence of this political arithmetic is found in the smaller edition: "A discourse concerning the "extent and value of lands, people, buildings, husbandry, manufactures, commerce, fishery, artisans, seamen, soldiers, public revenues, interest, taxes, registries, banks, valuation of men, "increasing of seamen, of militias, harbours, shipping, &c., as the "same relate to every country in general, but more particularly to "the territories of His Majesty of Great Britain and her neighbours "of Holland, Zeeland, and France." It may be said that to Sir William Petty is due the credit of initiating the study of statistics, using the term in the sense in which it is employed at the present day. Roscher, in his work, "The History of English "National Economy," referring to Sir William Petty's observations, writes at great length on the subject, and though he appears to take exception to the manner in which Petty has grouped his figures, he praises his efforts to deal with the statistical material of the most important countries at the same period, and appears also to thoroughly appreciate the manner in which only what is really of importance and general interest is clearly brought out.

Petty's experiments in political arithmetic, together with those of Graunt, were afterwards taken up by the celebrated mathematician and astronomer, Halley. In the third volume of "The Philosophical "Transactions of the Royal Society" there appears a notice of a work by this author, entitled "An Estimate of the Degrees of the "Mortality of Mankind, drawn from various Tables of the Births "and Funerals in the City of Breslau, with an attempt to ascertain "the Price of Annuities upon Lives." In this work, which was published in 1693, Halley based his calculations and estimates on the Bills of Mortality relating to the period comprised between the years 1687 and 1691, which were the first published by the city of Breslau. He drew up a table of mortality from these sources, and showed how the probabilities of life and death, and the value of annuities and assurances on lives might be determined, which he pointed out had until then only been done by an imaginary valuation. One particular table which he drew

up—a statement showing the numbers of the population living at Breslau, classed according to age—is still known as Halley's Bill of Mortality. An interesting pamphlet, entitled, "Edmund Halley and Caspar Neumann," by Dr. J. Grätzer, was published at Breslau at the commencement of the present year, and contains a mass of interesting and authentic information bearing upon Halley's works. We can do no more here than merely refer to this publication, as space will not admit of our quoting at any length from it.

The study of political arithmetic, using the term in Petty's sense, was continued later by King, Davenant, Derham, Short, and others, by all of whom the subject was carefully treated, and about the middle of the eighteenth century it attracted the attention of the two Dutch professors, Kersseboom and Struyk. The former, Knapp speaks of "as a man of great literary attainments, and 'possessed of a logical, discerning, and critical mind, who brought 'a powerful intellect to bear upon all questions into which controversial matter might enter, and subjected them to a thorough 'sifting and a rigorous examination.'" Kersseboom stated as the result of his researches, that the proportion of male to female children annually born was in the ratio of 18 to 17; that in early life the mortality is greater among the male than the female sex, and after this period a greater regularity appears to be maintained. Writing on this subject he says, using the words of his friend Professor S'Gravesande, to whom he submitted his tables and literary productions previous to their publication: "*Quot non sunt 'causæ a quibus hominis vitæ terminus pendeat? Regularis tamen in 'majore numero . . . est morientium series.*" Knapp also mentions another abstruse subject which presented itself to Kersseboom's mind—a subject which afterwards attracted considerable attention—this was the theory of the disappearance of accidents in quantitative aggregate observations. Kersseboom on this subject again quotes S'Gravesande: "*Nulla data irregularitas nihil 'fortuitum est, si ad res ipsas tendamus; hæc ignorantiam nostram 'spectant. Irregularē id vocamus cujus regularitatem propter 'variarum causarum concursum non percipimus. Fortuitum id 'dicimus quod non videmus a causâ determinata pendere, quamvis re 'vera a tali pendeat. Sæpe vero regularitas quæ consideratis paucis 'effectibus nos fugit ubi plures ad examen vocantur detegitur.*" The titles of the seven treatises of Kersseboom's, which appeared in the period comprised between the years 1737-47, together with a detailed account of their contents, are given in p. 60 of the first volume of Knapp's work.

Kersseboom recognises Halley, whom, however, he left far behind, as his predecessor and master in the science of determining the rates of mortality, and the method he employed to

determine these rates was somewhat similar to the one used by Graunt, viz., by taking in the first place his data from the Bills of Mortality, and basing his conclusions upon them. His system was, however, a far more perfect one than Graunt's, and more likely to lead to accurate and reliable results; he took a table giving the number of persons living at a given age, and in order to discover the actual mortality, traced this number into a later period of life. A detailed account of Kersseboom's literary contributions to statistical science, his estimate of the mean probable duration of life, his calculations of the actual numbers of the population founded on his observations of the bills of mortality, is given on p. 62 of the first volume of Knapp's work. Out of these rough calculations and estimates grew that important branch of statistical science which is known at the present day as "Vital Statistics." The actual phenomena of birth, existence, and death form in themselves a most interesting study, and one whose importance cannot be overrated; this was clearly recognised by Graunt and others who followed him, and who devoted much time and careful study to the solution of the many intricate problems of human phenomena. The question of the movement of the population is one which must always be of vital importance both to the student and the statesman. On this point Achenwall observes: "Man is essentially the first consideration of the State; the growth of a country's population is the pedestal on which it builds up its greatness. Passing through European countries, the traveller cannot fail to be impressed with the very considerable differences existing in the numbers of the population of the various countries. In some the population is so sparse that they would appear to be almost uninhabited, in others there is such a density that they would almost lead one to believe that the population must be out of all proportion to the means of existence. If we seek to account for these diversities, we find that they are influenced by a variety of causes. To thoroughly investigate these causes should be our first aim." In spite of this excellent advice, Achenwall and his school appear to stop here, and to remain content with merely theorising, and calling attention to these phenomena, without actually endeavouring to throw any light upon the question of the causes affecting the distribution of the population.

It is true that at first Graunt and Petty both treated the population phenomena as a question on which some attention might with advantage be bestowed, but at the same time they were of opinion that it did not properly come within the range of science. The astronomer Halley, however, went very much deeper into this question, and subjected it to a mathematical treatment, and he

insisted upon the great value and practical utility to everyday life, of a thorough knowledge of the subject. The Dutch professor Kersseboom devoted much time and careful study to the subject, and derived considerable assistance from it in the solution of intricate financial and economical problems. An account of his works is given in the "*Bulletin de la Commission Centrale de Statistique*," vol. iii, Brussels, 1857, under the heading of "*Notices sur la vie et les ouvrages de Gr. Kersseboom*;" and Knapp also calls attention to them in p. 66 of the first chapter of his work. The Frenchman Déparcieux also devoted considerable attention to the population question, and published in the year 1746 his "*Essai sur la probabilité de la durée de la vie humaine*," in which he had drawn up several new and valuable tables of mortality, one of them constructed from the registers of the nominees in the French tontines, principally those of the years 1689 and 1696, and the rest from the mortuary registers of different religious houses. Four of these showed the mortality that prevailed among the monks of different orders, and another that which obtained among the nuns in different convents in Paris. Déparcieux appears to have been the first to give the average duration of life after any age, and showed how to calculate it correctly from tables of mortality. His tables formed the basis on which the rates were fixed by the French "*Caisses générales de retraite de France*" for the purchase of annuities (Knapp, c. 1, p. 68).

The results of the investigations into this branch of statistical science which had hitherto been obtained were all carefully noted by Sussmilch, and further enquiries were made by him into the subject. He took great pains to collect the number of annual deaths in the different intervals of age, which he published in his "*Divine Orders*," issued in 1741, and of this a second edition, which was in reality a fresh work, twice the size of the first, appeared in the year 1761. The detailed and exhaustive information which this work contains, and the scientific manner in which Sussmilch handled his subject, obtained for him the justly merited reputation of being the most valuable contributor to that branch of statistical science which treats of the question of population.

As regards the increase of the population, Sussmilch also devoted much careful attention to this subject, and many things suggested themselves to his mind which were afterwards taken up and so successfully dealt with by Malthus. He was the first to observe that in nearly every country the number of births far exceeds the deaths, and that in consequence the population must be continually increasing; but he was of opinion that all things were ordered for the best, and that the increase of the human species would of itself be kept down to the level of the means of existence. Suss-

milch's views on the question of the fruitfulness of marriages were entirely original, and it fell to him to clear the ground of many fallacies, and to definitely declare the inaccuracy of many assertions which had hitherto remained unrefuted. As regards the proportion of the sexes, the result of his observations was that the proportion of male to female births was as the ratio of 21 to 20. Sussmilch may be truly considered a worthy successor of Kersseboom in following up the train of thought which the latter in his turn inherited from S'Gravesande, namely, the employment of statistics as a method in investigating the conditions and events by means of mass observations (*Massenbeobachtung*), and its application to all phenomena, human and physical, which reveal themselves as produced by constant and variable causes simultaneously. To arrive at an accurate conception of the laws which govern human phenomena it is necessary not to take any individual case, but to consider similar facts for the same country for different periods, or for different countries at the same time, and by noting the difference of circumstances in each, a true knowledge of the principles that are constantly at work in society is obtained. It would seem that the very fundamental point of the moral philosophy afterwards founded by Quetelet seems already to have been grasped by Sussmilch, as he goes on to say: "Is there not frequently to be observed disorder in moral things? . . . but may we not hope that in time we shall be enabled to judge of everything correctly, and to trace the connection of everything when we are in a position to grasp all the minor events in all their bearings, and to subject them to the clear light of scrutiny?" That Sussmilch far excelled all his predecessors in the selection of material which he employed in his researches is clearly shown by the fact that all his successors, even up to Quetelet's time, bore testimony to the general excellence of his work, and taking into consideration the great practical value of the materials with which he worked, the systematic order in which his data were classified and arranged, and the skill which he brought to bear upon their manipulation, he may be looked upon as the first true statistician, using the term in the sense in which it is employed at the present day.

Not only did he excel as a statistician, but he may also lay claim to the honour of being a distinguished economist, as he devoted much careful study to the question of the influence of production in determining the numbers of the population; and he also formed a thoroughly accurate conception of the manner in which the new science should best be applied to the solution of the intricate problems and vexed philosophical questions of the day.

His views on the mutations of human society taken in conjunc-

tion with the somewhat simple opinions he had expressed on political questions, was the cause of the undeserved contempt with which his views were looked upon for nearly a century. The very fact that Malthus, his immediate successor in the doctrine of population, and like him a Deist and theologian, took up a totally different ground, necessarily drove Susasmilch into the background; for Malthus only recognises an active God in the creation of the world and of humanity, but considers that after the creation both were left to their own independent development according to their innate natural laws. In particular he looks upon human society as an existence totally dependent on natural external influences, and within these bound up in its development with the natural internal impulses in so far as they cannot be subjected to the domination of the intellect and of the moral force thereby awakened. Malthus's conception is therefore essentially a natural historical one, which regards the whole development of society beyond the sphere of human intellect as by nature compulsory: whereas Susasmilch looks upon God as the eternal and sure arithmetician who orders everything temporal and natural according to measure, number, and weight. As a philosopher also Susasmilch was still further put into the shade when the well known views of the encyclopædists came to be generally adopted; and finally his opinions on the principles of population lost much of the original weight which was attached to them when Malthus, who using the data employed by him, propounded an entirely new theory. In spite of this there can be no doubt that Susasmilch was regarded as the legitimate successor of Graunt and Petty, in continuing the study and endeavouring to perfect the science of political arithmetic; and his efforts in this direction were attended with such signal success that he may be considered the most brilliant exponent of the new doctrine.

It is worthy of note that he, following the example of his predecessors, never made use of the term "*Statistik*" in connection with his observations; and even in the fourth edition of his "*Divine Orders*," which was published in the year 1775-76, there is no mention of this term. In the year 1809 Hoffmann, the father of Prussian official statistics, whom Engel calls a "*statistician* whose rare merit has been universally recognised," speaks of "*Petty's Political Arithmetic*" and not "*Achenwall's Science*" as the doctrine which occupies itself with the extent, limits, subdivisions, and natural relations of States, their advantages, their history, and their origin. In his well known "*Promemoria*" of the 21st February, 1809, speaking on the subject of the organisation of a statistical bureau in Prussia, Hoffmann remarks that at the head of such a department there should be placed a man who, with

a certain knowledge of the ground work, would be enabled, with the assistance of political arithmetic, to work up from the raw materials such clear and comprehensive statements as would show at a glance not only the condition of the population, the production or trade of a country at a given time, but by comparison show the progress or decline which had taken place in them. In recommending Professor Hobert to fill this post, Hoffmann remarked that if he were to bring to his new duties that skill and intelligence which he displayed in the management of the "Widows' Fund," he would be eminently qualified for the position of chief of the statistical bureau of the State. And yet the term "Statistik" must have been frequently employed when speaking of "political arithmetic" at the time this "Promemoria" was published. It was indeed about this time that a violent attack was made upon the political arithmeticians, chiefly directed by the followers of the Achenwall school, who appeared even then to foresee the preference which would before long be given to the distinguishing title of "political arithmetic" over that of "Statistik." An article couched in very violent terms appeared in the "Göttingen Journal" of the year 1806, vehemently reproaching the political arithmeticians with retarding the progress of statistical science. It went on to say: "These short-sighted persons not only deluded themselves, but attempted to make others believe that one could ascertain the importance of a State by simply measuring its area, estimating its population and national income, and then adding the number of its live stock." And in the "Jena Allgemeine Zeitung," on p. 130 of the issue of 1811, appeared the following passage: "The practice of ordinary politicians and statisticians, who measure everything by numbers and ordinary calculations, and who, wishing to agree to everything to a hair's breadth, would by means of the corporeal, gauge what is actually the spiritual, is beyond all expression supremely ridiculous." Thus the Göttingen school, which spoke of the science of statistics as the "highest and noblest," was in direct opposition to the English school of political arithmetic, which was identified by Sussmilch with the system of "tabular statistics." Tabular statistics, however, had their origin in Denmark, where the learned Anchersen, a contemporary of Sussmilch and Achenwall, was the first to compile in the year 1741 a valuable tabulated statement of certain important States, showing at a glance the area, population, religion, finance, army, coinage, weights, measures, &c. The example set by Anchersen in Denmark was soon followed in Germany by A. F. Brandel (Berlin, 1786 and 1792); by J. G. Bötticher (Königsberg and Leipzig, 1789); and by A. L. Crome, who produced the well known atlases of the area, population, and production of Europe, most valuable

works of reference of which many editions were published. In France also, Beaufort compiled, in the year 1789, very valuable statistical information in tabular form, and in other countries Anchersen's example was followed by many well known authorities on statistical subjects. Between "tabular statistics" and "political arithmetic" there is a considerable difference, for while the former has this in common with Achenwall "Statistik," that it considers facts collected without reference to their mutual dependence, with the principle of political arithmetic it is in harmony so far that it only considers those facts which are capable of numerical expression, without indulging in the high-flown phraseology of the Göttingen school. Thus "tabular statistics" would appear to form the connecting link between the two sciences, and by reason of its clear and comprehensive array of figures, it may be taken as the basis on which the statistics of the present day were formed, which proceed wholly by the accumulation and comparison of facts, stating them in figures and tabular exhibitions, disregarding any kind of speculation, and applying the epithet "statistical" only when a fact has been mathematically demonstrated.

It is well known that "tabular statistics" became the foundation of the comparative statistics of Büsching, and which were largely employed by Niemann and Malchus in Germany. In Austria they particularly found favour, and the system of comparative statistics was employed by all the leading Austrian statisticians, from Lucca down to Brachelli. It must be borne in mind that the political arithmetic of Graunt and Sussmilch is not to be confounded with that branch of mathematics which comprises the method of calculation employed in insurance offices in connection with matters relating to annuities, tontines, &c., which by reason of the State supervision under which they were placed, received the name of political arithmetic. Again the term political arithmetic has been imagined by many to specially refer to the population statistics, and *vice versa*. Even both Rumelin and Wagner seem to have fallen into error, the former when he asserted that Kniess (in his justly celebrated work published in 1850, "Statistics as an independent Science") "in the separation of the heterogeneous elements of the word statistics had not gone to the root of the question;" while the latter says that Kniess has appropriated a signification to political arithmetic which rightly belonged to Sussmilch's science, between which and the political arithmetic there existed a very considerable difference.

Lueder, who was a witness of the storm which broke over the political arithmetic school, says in his "Kritik der Statistik und Politik," published in the year 1812, on p. 57, that "ordinary statisticians," referring to the political arithmeticians, "earned

"for themselves everlasting gratitude for the investigations which led to the discovery of the laws of mortality; a discovery to which was due the improved system in the management of the 'Widows' Fund;' absolutely nothing was done by the higher statisticians." Niemann, in his "History of Statistics and Politics," 1807—less bigoted than the majority of the contemporaries of the Göttingen school—says of political arithmetic, "its employment in determining the social conditions of men by the consideration of facts which have a bearing upon them; in considering these facts for different periods in order to compare them and then see how far and in what particular, progress or decline had taken place; in studying the influences exercised by physical and political causes, has done more for the improvement of the political condition of States" (*Staatskunde*) "than the mere piling up of figures which are frequently so little to be relied upon." Niemann quotes extensively from Simond, Necker, Young, and Adam Smith, though the latter would appear, by his observations in "The Wealth of Nations," to have been no great believer in political arithmetic, as he says, "I have no great faith in 'Political Arithmetic,' and I mean not to warrant the exactness of either of these computations."

Among the celebrated statisticians of this age, the philosopher Lueder appears to have been the only one who foresaw the great revolution of ideas which was fated to take place consequent, on the one hand, upon the English discoveries of the last century and the observations of the encyclopædists, and, on the other, upon the French revolution and the Napoleonic victories. He remarks, "Ideas, if they had taken deep root, had to be given up and exchanged for others; one prejudice after another had to be acknowledged as a prejudice; so little by little one frail prop after another was removed, until at last the whole fabric of statistics, to my no little astonishment, gave way, and carried with it politics, which, without statistics, are of little value." On the title page of his "Kritik" he puts Bacon's sentence as a motto—"*Homo naturæ minister et interpres tantum facit et intelligit, quantum de naturæ ordine, re, vel mente observaverit; nec amplius scit aut potest.*"

It was more particularly in France that the example of Halley and Newton was followed, and the studies which they initiated were elaborated and continued by Laplace, who, by his "*Mécanique Céleste*," gained the respect and admiration of his contemporaries. This work is worthy of honour, as it was the first in which minute investigations had been made into the mathematical nature of the theory of probabilities. The result of his researches were made known in the excellent work entitled "*Essai philosophique sur la*

"théorie de la probabilité," in which he observes, "what does chance mean? Chance seems conveniently to veil our ignorance; we employ it to explain effects of whose causes we are ignorant. To one who knew how to foresee all things there would be no chance, and the events which appear to us most extraordinary would have the natural and necessary causes in the same manner as do the events which seem most common to us. We should therefore be able to attain a thorough knowledge of the future if a human intellect were capable of grasping not only what has taken place, but what will take place, in the same manner as an astronomer reads the heavens."

Laplace in the French Chamber of Peers endeavoured to initiate a new and more perfect system of collecting, arranging, and comparing those facts which can alone form the basis of correct conclusions with respect to social as well as political government, and the time was the more ripe for this necessary improvement, as it was about this period that a question arose in the French Senate respecting the number of the population then existing in France, a question which none then appeared to be able to answer. It may truly be said that the French Census of 1802 was in a great measure the direct result of Laplace's efforts in the cause of statistical science.

The work so ably commenced by Laplace was afterwards taken up by the celebrated mathematician and physician Fourier, who, according to Knapp, after the fall of Napoleon, was appointed by Chabrol, the Préfet of the Seine, as chief of the Statistical Bureau of Paris.

The cause of statistical science is largely indebted to Fourier for his efforts, which in a great measure contributed to bring it into the state of perfection in which we find it at the present day. Laplace and Fourier both exercised considerable influence over the young Belgian mathematician and astronomer Quetelet; indeed, it was with the object of obtaining his opinion on the then burning question of the organisation and establishment of an observatory at Brussels, that Quetelet personally made the acquaintance of the former. So it will be seen that political arithmetic experienced its revival and development at the hands of these two highly gifted and talented scholars.

Quetelet opens his well known *chef-d'œuvre* of 1835, with this remark, "L'ouvrage que je présente au public est en quelque sort le résumé de tous mes travaux antérieurs sur la statistique." Quetelet's two chief works were those entitled "Sur l'homme," published in 1835, and the "Système Sociale," in 1848; his others, more especially his treatises and notes, are not so well known. Knapp rendered a very valuable service to science when he under-

took the review of Quetelet's profound scientific works; and his task must have been by no means an easy one, as he carefully went through sixty-five of his works (among them being a few pamphlets and short sketches). The result of his labours appeared in Hildebrand's "Jahrbuch," editions of the years 1871-78, pp. 167-74, 342-58, and 427-45. Even the short notices contributed by Quetelet to the Academy of Brussels were enumerated, almost without exception, only the very unimportant ones, those for instance, which relate merely to the circulation of, or the reception accorded to a previously published work, being omitted. For a detailed account of the whole of Quetelet's works, Knapp refers to the "Tables générales analytiques du recueil des Bulletins de l'Académie de Bruxelles," 1858 and 1867.

It appears from Knapp's review that the better known of Quetelet's chief works are to a great extent reproductions of his earlier single treatises, as he points out that the greater part of his "Essai sur l'homme," the "Système Sociale," in its more important part, and the "Physique Sociale," published in 1848, were almost literal reproductions of Quetelet's earlier literary compositions. According to Knapp, Quetelet appeared to have been in the habit of contributing numerous short sketches and memoranda on any original subjects and opinions, which were published in the bulletin of the Brussels Academy, and on these notices he built up his own more important works. Knapp separates the whole statistical literary efforts of Quetelet into the periods 1826-35, 1836-48, and 1849-74, the year of his death, concluding with his "Physique Sociale," and the "Anthropomagic;" and he divides his pamphlets into two distinct categories: "Social statistics" and "Anthropology;" the latter treating of the physical and psychological conditions of man as individual things, and introducing his theory of the typical human unit or average man (*l'homme moyen*), and the tendency to crime (*penchant au crime*). In the former he goes more deeply into the question of the effects of social influences over man, and deals not only with the individual actions of man, but also with the natural phenomena of births and deaths, for apart from economical, moral, and political conditions of society, the number of marriages and the rate of mortality in early infancy are just as dependent on the social conditions and manner of life, sanitary regulations, compulsory vaccination, &c., as they are upon place, season, period, &c. It is manifest, however, that one description of cause, such as astronomical or meteorological, is entirely beyond the range of human influence, while other causes are to a certain extent in the sphere of human will; thus we are enabled to distinguish between natural and social causes. But as Knapp remarks, "it is impossible to rid ourselves of one or the other of

"these causes, and as the death-bringing influence always attains its end physically, it would be incorrect to denote one description of cause as though it were of a different order to the other."

The sixty-five works of Quetelet which Knapp reviewed were classified by him in the following groups:—Anthropological, Demographical, Moral and Mathematical (his "Theory of Probabilities" is an excellent example of this category); and finally his works on statistical method and the three already mentioned chief works, which treat at the same time of questions relating to political and social statistics, and also to anthropology. The contents of these works Knapp again separates into three distinct categories; the first in which the typical human unit, or *l'homme moyen*, and his physical and mental construction is carefully worked out; he points out in particular how the tendency to crime is treated in an essentially anthropological sense. A further point to be noticed is the revival of vital statistics, and the theory of regarding society as a system whose motive power had to be established. The question as to what extent man is responsible for his actions, which are in a great measure dependent upon social conditions, is here touched upon, and hence the question of the legality of human actions also arises; on this point statistics may be relied upon to render material assistance, for by reason of their mathematical treatment it is eminently adapted to the solution of these intricate problems. In the second category Knapp discovers among other things that anthropology is extended to all bodily and mental qualities of man, and finds the earlier investigations into crimes combined with marriages under the heading of "moral statistics;" and finally in the third category Knapp dwells upon the theory of probabilities, whose method enables us "to express more precisely the results of experience, as it teaches us also in the main to do with more regularity and precision than which even the most judicious have hitherto done in a manner more or less vague. It tends, moreover, in the phenomena with which we have to occupy ourselves, to substitute science for that which is conventionally termed practice or experience, and which is most frequently but blind routine."

On the subject of population statistics Quetelet does not appear to have formed any original views; to a great extent he relied mainly upon his predecessors from Graunt to Süssmilch and Malthus, though he only casually refers to the former, and he does not appear to have thoroughly grasped the grand conception of Malthus. His chief merit lay in the stimulus he gave to the adoption of the official method of dealing with the question, and to the perfection of its mathematical treatment. Having inherited the doctrines of Laplace and Fourier, he and his contemporary Moser

laid the foundation of the improved method of treatment employed in dealing with that branch of statistics relating to the population known as "Vital Statistics," which was only developed and perfected in later years by Engel, Wittstein, Baumhauer, Farr, and Korosi, and more particularly brought into notice by the works of Knapp, Zeuner, Lexis, and others. Political arithmetic received at Quetelet's hands a fresh stimulus by reason of its adoption in connection with "moral statistics," and in the employment of its methods in connection with the question of anthropology; and although Guery published in 1833 his "*Essai sur la Statistique morale de la France*," it was mainly due to Quetelet's efforts in 1847 that the importance of political arithmetic in connection with moral statistics was first clearly brought to light. Everything points to the fact that not only did "statistics" owe their identification with the old "Political Arithmetic" to Quetelet, but also by reason of the employment of its methods in connection with the then new social science, the term became very much more general, and it may justly be considered to be far more properly applied to Quetelet's science than to Achenwall's.

Fallati and Schubert, who were the two most eminent theorists of the Göttingen school, were opposed to the appropriation of the old title by Quetelet, and the former propounded the theory that "statistics" should be divided into the "abstract" and "concrete," according to whether they are used in a general or a particular sense. The former he defines as the "ideal condition," "the visible regularity of clearly accidental external appearances;" the latter, the "real condition," or the "sum of these appearances which commend themselves easily to ordinary understandings." The proper foundation of true scientific statistical knowledge, viz., "concrete statistics," according to Fallati, lies in the investigation of all phenomena *quæ vitam hominis excedunt*, which include the religion, the composition, and administration of a State, its climate, nature of the soil, public laws, historical and geographical conditions, &c. Fallati would even appear to go further than this, and says that we should also take into consideration all the "broad facts relating to the life and constitution of States." "The functions of the 'ideal condition' are to bring to light these general facts, and search out and decide upon the causes affecting the variability of such phenomena as births and deaths, human industry, and commercial activity; matters in fact which form the very basis of a nation's progress or decline, its wealth or poverty." "Concrete statistics" may be accepted as comprising the "special scientific knowledge of a State," and according to Fallati, "has much in common with what is now understood as the non-statistical branch of Achenwall's 'Statistik.'"

In "abstract statistics" we have before us an array of units of different values, and its aim is to arrive at a basis on which a comparison of these units could be founded. It is obvious, therefore, that to obtain any accurate and reliable results, the connection of arithmetic with abstract statistics is indispensable, just as logic is necessary to other branches of statistical science. But arithmetic, and particularly "political arithmetic," can have no more claim than logic to be considered as actually forming a branch of statistical science. Fallati goes on to say that he looks upon "abstract statistics" as identical with "political arithmetic," and acknowledged that it was in great measure to Quetelet's efforts that its perfection was due. He remarks that "Quetelet, in his work '*Sur l'homme*,' laid the foundation of a new theory of " 'abstract statistics,' whose main point is that of the 'typical " 'human unit,' and which, although it particularly treats man as a " fragment of the social body, that is, as a social being, and though " it takes up from this point the result of the old political arithmetic, it does not confine itself to it, but is extended to the " whole abstract statistics of mankind."

Fallati thoroughly recognised the social scientific character of "political arithmetic" and its development by Quetelet, and says, "the sphere of 'abstract statistics,' as a particular branch of " statistics or as a particular doctrine, has not up to the present " (1843) any specially defined limits; it is only very recently that " it appeared to be confounded with 'concrete statistics,' though in " its eagerness to become independent of the latter it went far " beyond the range of 'concrete statistics,' more especially by the " pretensions it had of discovering the laws not only of present " phenomena, but also of the past and future; so that it interfered " to a considerable extent in the sphere of other sciences."

Kniess, in his "Statistics as an Independent Science," goes deeply into the subject of the relative functions of these two branches of the science, and concludes a discursive review of the subject by declaring himself entirely opposed to Fallati's theory, though he cannot withhold from him a high tribute of praise for the clear and comprehensive manner in which he dealt with his subject. As a method applied to all phenomena, both past and present, Kniess is strongly in favour of the adoption of the name "Statistik" for "political arithmetic," called by him "mathematical statistics," to distinguish Achenwall's and Schlözer's science, as the doctrine which treats of questions affecting the political and social conditions of nations; and he is also in favour of a descriptive as well as a mathematical treatment. Even the term "demography" or "demology," which was employed for the first time by the French statistician Guillart

in his "Élément de la Statistique humaine," and accepted by Engel, could not restrain the general use of the name "Statistik," and the less so as the term demography, which chiefly through the efforts of Bertillon had been first brought into use, is regarded by those who are most in favour of it as of somewhat vague and uncertain meaning. That meaning, however, has been universally accepted which Kniess was the first to establish as a perfectly independent one, and which could not be confounded with that which had hitherto been attributed to it. On this point Rümelin, after an exhaustive review of all the cases in which the terms "statistical" and "statistics" are used in every description of scientific work, observes, "it is, furthermore, possible to prove statistically that at the present day the meaning of the term 'statistics' is generally accepted to imply the result of any arithmetical computation. On the other hand, the interpretation theoretically and professionally adopted by an university statistician, belongs to the above classification also, of a description (the distinguishing feature of which is the selection of words used) of the constitution of existing States, of the domestic customs of races, &c., can be considered as coming within the range of statistics."

It is obvious that in the scientific world statistics do not now occupy the same position in relation to history as Achenwall imagined, but are more akin to astronomy, geometry, and other kindred branches of science, for they have become an actual science of observation in the service of social science. It is a science with a definite aim, an orderly classification of subjects, a numerical method with its strict rules of synthesis and analysis, by which it is endeavoured to illustrate by facts the conditions and prospects of society, in fact, according to Roscher's "History of National Economy in Germany," "the present meaning of the term 'statistics' is exactly identical with the realistic tendency of that national economy which was designated by Knapp as 'the minor German branch of the social scientific realists,' termed by Wagner 'the school of social politicians,' and represented principally by Schmaller, Knapp, Neumann, and Schonberg."

Knapp in his "New Theory of Moral Statistics," says that "in dealing with the condition and progress of society, statistics enable us to take a comprehensive view of society in all its relations and progress, and by comparing the condition at different times they throw light upon the causes which determine the conditions of men, and afford the means of verifying theories which have been propounded on the subject of social science."

A decided historical change has taken place in the original

meaning of statistics. Achenwall's "Statistik" was synonymous with "Staatskunde" or "State science," and regarded as a historical and descriptive doctrine, and one of paramount importance to the legislator; the statistics of to-day is a doctrine of measurement and calculation, applied to the investigation of social phenomena, not necessarily as Knapp observes, to "discover" the laws which govern the condition and progress of society, "but to obtain an insight into facts which by comparison will acquaint us with the characteristics and the course of development of the subject treated. It has for its basis the observation of measurable facts, whose necessary expression are numbers, and whose indispensable adjunct, mathematics." As Zeuner says, "Even on the very threshold of the scientific realisation of this valuable adjunct it is clear that a great future awaits our present statistics, and we may reasonably anticipate that the combination of statistics and analysis will create a science which will excel every other based on mathematics, not even excepting astronomy, mechanics, and physics."

The progressive exactness and similarity of the observations of all the measurable phenomena of social life are indispensable to the progress of our insight into the development of the social world, and the observation of these social facts, and of their relationship, depends mainly on the so called official or practical statistics. The greatest attention should therefore, in the interests of society, be devoted to the increased development and the perfection of these social observations.

CENSUS of BENGAL, 1881.

THE following notice of the Report of the Inspector-General of Registration, Bengal,* is by Henry Beverley, Esq., and may be deemed to be in continuation of a paper on the Bengal Census of 1872, read by him before the Society on the 17th March, 1874, and will be found in vol. xxxvii (1874) of the *Journal*.

The first census of the territories subordinate to the Lieutenant-Governor of Bengal was taken under the superintendence of the present writer in the early part of the year 1872; and some of his readers may recollect the astonishment with which the result was received at the time. That result showed that the Lieutenant-Governor of Bengal was practically the ruler of nearly 67 millions of people, a number far in excess of what had up to that time been supposed to be the true population. The soil of Bengal was found to be more densely populated than that of the United Kingdom, while parts of the country surpassed in this respect all previous experience. It may well be imagined, therefore, that the results of the second census which was taken in 1881, have been awaited with considerable interest and curiosity. Would this second census confirm or contradict the results of the first? Or might it not be that the census of 1872 understated the population, or that the figures of the two censuses varied to such an extent as to make both sets of figures equally worthless? These questions have now been set at rest by the publication of Mr. Bourdillon's report, and it is proposed in this brief notice to draw attention to some of its more salient features.

Since the census of 1872 was taken, the province of Assam has been separated from the Lieutenant-Governorship of Bengal, and constituted a distinct administration. In 1872 the area of Bengal, as administered by the Lieutenant-Governor, was 248,231 square miles; since then it has been reduced to 187,222 square miles, the population of which in 1872 aggregated 62,705,718 persons, of whom 31,341,366 were males, and 31,364,352 females. In the recent census the population of this territory has been returned as 69,536,861, of whom 34,625,591 are males, and 34,911,270 females. The figures thus show an increase in the population of 6,831,143 persons, equivalent to 10·89 per cent. It is clear therefore that in 1872 the population was not overstated.

* "Report on the Census of Bengal, 1881." By J. A. Bourdillon, of the Bengal Civil Service, Inspector-General of Registration, Bengal. Calcutta, 1883.

Neither as a whole can it have been greatly understated. No doubt each successive census of any country should approximate more nearly to accuracy—and this remark is especially true of an ignorant and uncivilised country like India. No doubt also, in some of the wilder outlying districts, where unscientific methods of counting were employed and a simultaneous enumeration was not attempted, the figures of 1872 are found to have been considerably below the truth. Still, on the whole, an increase of 10·89 per cent. in nine years, giving an average annual increase of 1·21 per cent., is not *primâ facie* an excessive rate of increase, and would not in itself imply any serious omissions in the census of 1872.

The outlying districts to which reference has been made, are those of Darjeeling, Jalsigoree, and the Chittagong Hill Tracts, in Bengal proper; the Sonthal Perganas in Behar, Argal and Barku in Orissa, Chota Nagpon and the Feudatory States. In these districts the enumeration of 1872 was carried out by rough and ready methods, and under very imperfect supervision. In one district the people were counted by means of notches cut in a stick; in another by knots tied on a string: in some parts the figures returned were merely the estimate of the chief civil officer; in others they were based on a rough survey; while in many cases they were simply such as the native chiefs themselves chose to furnish, without any check or examination whatever. It is plain that no great reliance could be placed on returns obtained in this manner. Accordingly we find that whereas the population of these districts was estimated in 1872 to be 7,339,713 persons, it is now returned at 9,636,628; giving an apparent increase of no less than 36 per cent. This of course cannot be a natural increase, and only shows that the estimates arrived at in 1872 were greatly below the mark.

Deducting these figures, however, from those for the entire provinces, we have as the population of the purely regulation districts, in which more or less of a regular, scientific, and simultaneous census was attempted in 1872, 59,900,233 in 1881, as compared with 55,366,005 in 1872; giving an increase of about 8 per cent. for the nine years.

Unfortunately we are as yet very far from knowing what is the normal rate of increase in an Indian population. As pointed out by Mr. Bourdillon, there is every reason to believe that both the birth-rate and the death-rate are considerably higher than in this country; but the true rates have not yet been ascertained, and no safe deductions are therefore to be based upon them. And the difficulty is further enhanced by the occasional occurrence of those terrible visitations which take place from time to time, devastating large tracts of country, upsetting all human calculations based on

normal averages. Under the strong rule of British bayonets, war is no longer permitted to desolate the country as formerly, but plague, pestilence, and famine are unhappily more subtle, if not equally fatal agents of death. Even during the nine years under review Bengal was visited first by a severe scarcity, the evil consequences of which were only staved off by exertions almost superhuman and a vast extraordinary expenditure; secondly, by three distinct epidemics of malarious fever; and lastly, by one of those destructive convulsions of nature which every now and then startle the civilised world for a few weeks, and then are as quickly forgotten.

The Bengal famine of 1873 was fortunately not attended with any great loss of life, so that persons have been found to deny the occurrence of any *famine* at all in the strict sense of the word. Be that as it may, "the very districts where famine threatened "most darkly," to quote Mr. Bourdillon's words, "now show the "largest advance in their population;" the scarcity far from reducing the population was probably, owing to the unsparing "efforts of Government, the means of prolonging many lives which "otherwise would have paid the debt of nature." The population of the Patna division, already one of the densest in the world, has apparently increased to the extent of 14·8 per cent. during the nine years; and, what is more extraordinary still, the increase is greatest just in those districts in which the scarcity was most keenly felt. Thus in Mozafferpoor the increase has been 14·99; in Darbhanga, 23·09; and in Champaran, 19·48 per cent. It is argued by Mr. Bourdillon that these figures prove that the population must have been understated in 1872, and it is possible that there may have been some understatement. At the same time it is suggested that there may be another explanation of the increase. The three districts in question border on Nepal, and it is admitted that on that side there was in 1872 room for an increase of cultivation. During and since the so-called famine, a large amount of capital has been poured into these districts; railways and canals have been constructed; a succession of favourable harvests has further enriched the inhabitants; and it would indeed have been remarkable had the census afforded no evidence of this increase of prosperity.

It may be mentioned in this place that the only other division which shows such a large general increase is that of Orissa, where famine wrought sad havoc in 1866. In this division the increase is nearly 18 per cent., and Mr. Bourdillon accepts it as representing "an actual advance in the numbers of a population recovering, "during a series of prosperous years, from the famine which "decimated it in 1866."

But if famine has not claimed its victims during the period under review, it cannot be denied that pestilence has been busy among the population. The epidemic disease known as the Bardwan fever is estimated by Mr. Bourdillon to have slain over 2 millions of people in the twelve years during which it raged. The Bardwan division actually shows a decrease of 2·77 per cent. during the nine years under notice; the decrease in the Hooghly district being as high as 12 per cent. But the normal condition of things is such that it may fairly be assumed that the population should have increased by at least 10 per cent. during the nine years. If this be so, the figures show that about a million of persons fell victims to the disease within that period in that division. A similar fever has recently ravaged the district of Nuddea, which nevertheless shows an increase in population over the returns of 1872. But in the districts of Rungpore and Dinagepore, disease has not only checked the progress of the population, but actually thrown it back, the decrease in Rungpore being 2·5 per cent. "Rungpore fever," as Mr. Bourdillon remarks, "has passed into a proverb in Bengal." "Of seventeen adult Europeans in Dinagepore in 1877, fifteen had to leave the district during the year, broken by repeated attacks of fever, "and official business could hardly be carried on." And if, as in the case of the Bardwan division, we assume that under a normal condition of things the population in these districts would have increased at the same rate as in the other districts of the division, it would follow that something like half a million of persons were carried off by the Rungpore fever during the nine years under notice.

Nor has pestilence been the only factor at work to check the natural increase of the population. Large portions of the three maritime districts of Backergange, Noakholly, and Chittagong were devastated by the storm-wave which accompanied the memorable cyclone of 1876, and by the epidemic of cholera which followed in its train. These three districts lie at the north-east angle of the Bay of Bengal, at the mouth of the delta formed by the Brahmapatra, the Gauges, and the Megna. The three rivers here unite to form a noble estuary by which almost the entire drainage of the Gangetic valley, Assam, and Eastern Bengal, is conveyed to the sea. The estuary is studded with large islands, which are the crests of the new formation of alluvial deposit, and which, in process of time, become connected with the mainland. As the islands rise above high water mark, they begin to produce grass and fuel, and in course of time are brought into cultivation, the homesteads of the resident cultivators being erected on artificially raised ground, and being further protected by a mud

embankment and a belt of trees. The cultivators themselves, whether on the islands or on the mainland, notwithstanding the risks to which they are constantly exposed, are among the most prosperous peasantry of Bengal. On the 31st October, 1876, the rivers were swollen, as usual at the close of the rainy season, and it was the time of the full moon, and the tides were abnormally high. Such were the conditions under which the cyclone, which had been working its way up the Bay of Bengal, fell upon these devoted districts. Striking the coast with the flow tide, it met and overpowered the mass of fresh water rolling down to the sea, and raised a storm-wave which rushed over the islands and a considerable part of the mainland, carrying everything before it. It was estimated that some 3,000 square miles of country were submerged to a depth of from 10 to 45 feet. A few of the inhabitants escaped by being caught in the trees which surrounded their homesteads; but the loss of life was, as may be imagined, enormous. The present writer visited the scene within a few days of the occurrence with the Lieutenant-Governor, Sir Richard Temple, and he will never forget the sickening spectacles that everywhere met the eye. It was then roughly estimated that some 215,000 persons had been drowned, though subsequent inquiries reduced the number to 122,238. "As was inevitable, however, the thousands "of decomposing corpses of men and animals and the rotting "vegetation poisoned the air and contaminated the drinking "water, and a terrible outbreak of cholera followed," which is said to have carried off 105,386 persons, making a grand total of 227,624, or over a quarter of a million. It is probable, however, that this estimate is under the mark; for there is no reason to doubt that, in the absence of this great catastrophe, the population would have advanced in the same ratio as in the adjoining districts. Now, in Fawudpore, Dacca, and Tipperah, the population has increased by 10 per cent., and at this rate the three districts affected by the cyclone have lost some 385,000 souls. It seems probable, therefore, that the original estimate of the number of those drowned was not far from the truth.

It has been stated that the Burdwan fever probably carried off something like a million souls, and the Rungpore fever about half a million; if to these figures we add 385,000 souls as the estimated loss by the cyclone and its consequences, we shall have a total of 1,885,000 persons whose death may be accounted for by non-natural causes. If this number be added to the population of the strictly regulation districts as ascertained by the recent census, we shall find that the rate of increase would have been 11·5 instead of 8 per cent.

Accepting the census figures, however, the total inhabitants

in the lieutenant-governorship of Bengal number 69,536,861; in other words, to quote Mr. Bourdillon's report, "They exceed in number the population of any European nation except Russia; they do not fall far short of the total population of France and the United Kingdom added together, and they exceed by 50 per cent. the population of the great German Empire, and by 38 per cent. that of the United States of America." "The average Bengal district has a population equal to that of the Grand Duchy of Baden, the Irish province of Leinster, the English county of Surrey, or the State of Virginia. For the larger districts few parallels can be found in the United Kingdom. . . . Indeed the counterpart in Bengal of the British county is not the *district*, but the *subdivision*. The average population of the 135 sub-divisions in Bengal is 487,762 souls. In England and Wales each county contains on an average 499,390 persons, but if the purely metropolitan county of Middlesex be omitted from the calculation, as Calcutta and its suburbs have been, the average population of each county becomes 451,950; so that the subdivisional officer in Bengal is entrusted with the supervision of a larger number of persons than the lord-lieutenant of an English county." And it might be added for the benefit of those persons in England who think that all the important posts in the country are monopolised by Europeans, that with very few exceptions these subdivisional officers are natives of Bengal.

Excluding the Feudatory States, Bengal has an average density of 442 persons to the square mile, as compared with 445 in England and Wales, and 486 in Belgium. But in so vast a territory some parts are naturally more populous than others. In Bengal proper (which is half as large again as England and Wales) there are on an average 505 persons to the square mile; in Behar (which is as large as the new kingdom of Roumania) there are 524; and in some of the districts of this latter province the pressure of the population on the soil is almost incredible. Thus, in Darbhanga the average number of persons to the square mile is 789; in Patna, 845; in Mozafferpore, 859; and in Saran no less than 869. And yet in these districts the people are multiplying, under the peaceful and beneficent sway of British rule, as fast as anywhere in India.

One of the most unexpected facts elicited by the census of 1872 was the large number of Mahomedans in Bengal, and their distribution throughout the province. It was then found that 31.19 per cent. of the total population were Mahomedans. The recent census shows that they have advanced in much the same ratio as the rest of the population, and that they now form 31.21 per cent. of the total. Their distribution is also found to correspond with that exhibited by the census of 1872.

The number of Christians in the province has increased from 91,066 in 1872 to 128,125 in 1881, or at the rate of 40 per cent. in the nine years. But a large proportion of the Christians in Bengal being Europeans and Eurasians, whose numbers are almost stationary, the rate of increase among native Christians is much higher. As a matter of fact the Europeans and Eurasians seem to have decreased from 42,109 in 1872 to 40,736 in 1881; while the native Christians have increased in the nine years from 48,957 to 87,399, that is, by 78 per cent., or nearly 9 per cent. per annum. This marvellous increase is mainly to be attributed to the success of missionary labours in the Sonthal Pergunnahs and Chota Nagpore. For instance, the native Christians in the district of Lohardugga have increased from 12,781 in 1872 to 36,281 in 1881; in Singhbhum from 852 to 2,988; in the Sonthal Pergunnahs from 392 to 3,057.

The idea of a census being no longer in 1881 the novelty it was in 1872, it was only fitting that an attempt should be made to collect further information relating to the people. Accordingly in addition to the matters inquired into in 1872, questions were asked regarding the conjugal condition, the birthplaces, the mother-tongue, and the degree of education of each person; and the information as to age was sought in greater detail than in 1872. The information gained under some of these heads is curious and interesting.

The inquiries as to the conjugal condition of the people, for instance, disclose two features of singular interest to the European observer. In the first place the published figures show that nearly half the men, women, and children in Bengal at any given time are actually married. The married number 49 per cent. of the total population, as compared with 34 per cent. in England; or, if the widowed be included, those of the population who have gone through the ceremony of marriage number 62 per cent. in Bengal, as compared with 40 per cent. in England. It should be explained however that the term "marriage" in India includes a betrothal which has not yet been followed by cohabitation, and betrothals take place at a very early age. Still, as Mr. Boardillon points out, "when once the wedding ceremony has been performed, the parties are regarded as formally married, and are invariably spoken of as such, the death of either party throwing the other into a state of "widowhood," even though they may never have seen each other since the day of the betrothal ceremony. And again: "The child-wife is as much married at 10 as she is at 30, and the burden of "Hindoo widowhood presses as heavily on the virgin widow of "12 years as on the widowed grandmother of 60." And to show how universal marriage is, we have only to look at the statistics

regarding the unmarried. From these we see that of males between 30 and 40 years of age only 5 per cent. have remained bachelors. while of women between 20 and 30 only 1 per cent. are still spinsters. "Practically it may be said that almost the whole "female population is transferred from the single to the married "state before their twentieth year."

A second curious feature in these statistics is the enormous proportion of widows among the female population, no less than 21 per cent., or over one-fifth of the females being returned as widows, as compared with 7.5 per cent. in England. The explanation of this is that among Hindus the remarriage of widows is not usually permitted, and is practically unknown. Men who have lost their wives may marry again, and accordingly we find that the proportion of widowers is about the same as in England, namely 4 per cent. of the male population. But girls who have the misfortune to lose their husbands are condemned to a perpetual widowhood, even though the husband may have been a mere child, and the betrothal never have been consummated. Indeed one of the most melancholy considerations in connection with this subject is the enormous number of young widows, to whom by the customs of the country remarriage is denied. Of the total number of girls under 20, some 5 per cent. are widows; of those between 20 and 30 some 12.5 per cent. Out of the 7,500,000 widows in Bengal, upwards of 300,000 are under 20 years of age. This is not the place to enlarge on the immoral and inhuman features of this social law, but it may be hoped that the statistics now for the first time made known, may serve to strengthen the hands of those who are nobly and manfully working to bring about its repeal.

Although the number of widows so largely exceeds that of widowers, the numbers of the married of both sexes, that is, of those whose husbands or wives are living, are (as of course they should be) nearly equal. The married males enumerated were 17,000,536, and the married females 17,048,323. But the prohibition of the remarriage of widows (while that of widowers is allowed) necessitates the marriage of girls at a much earlier age than that of males, so that, as a rule, Bengal husbands are eight years older than their wives.

The evidence which the census tables afford of the extent to which polygamy is practised in Bengal, has been carefully examined by Mr. Bourdillon, with the result of showing that the practice is virtually unknown among Hindus, and extremely uncommon even among Mahomedans. "Among Hindus," writes Mr. Bourdillon. "a plurality of wives is not permitted by the canons of their faith "except for sound and good reasons;" and, as a matter of fact, the

returns show more Hindu husbands than wives, the excess being no doubt due to the fact that many Hindus who come to Bengal for trade or service leave their families behind in other provinces of India. Among the Mahomedans, on the other hand, whose religion permits, if it does not inculcate, polygamy, there are 1,033 married women to every 1,000 married men; and, although a certain indefinite number of Mahomedan husbands must have been at sea on the night of the census (for native sailors are always Mahomedans), Mr. Bourdillon nevertheless comes to the conclusion, in which he is apparently justified, that polygamy is practised to a small extent by the Mussulman population. The wonder indeed is that the extent to which it is practised is as small as it is; but the truth is that owing to the cost of the ceremony, and the extra expense of maintaining two or three families, a plurality of wives is a luxury only to be indulged in by a few rich men.

The age tables, though not altogether trustworthy, confirm the results of the former census as to the large proportion of children compared with European experience. In 1872 the children under 12 years of age were found to be 34·5 per cent. of the total population, as contrasted with a percentage of 29·4 in England. The recent census shows that children under 10 compose 29·69 per cent. of the population, as against 25·45 per cent. in Great Britain, and 23·76 per cent. in Ireland. It also appears that as, in 1872, the percentage of children is greatest among the aboriginal tribes, and that it is next highest among the Mahomedans, the majority of whom are probably converted aboriginal tribes. The figures may, of course, mean a comparatively high birth-rate, or a shorter average duration of life. Both causes probably combine to bring about the excessive percentage of children. The universality of marriage must necessarily result in a high birth-rate; while there seems little doubt that life is much shorter in India than in Europe. In the absence of any general and trustworthy registration of births and deaths, it is impossible to speak with confidence on this subject; but Mr. Bourdillon is probably not far wrong when he estimates the annual birth-rate in Bengal at 45 per mille, and the annual death-rate at not less than 34 per mille.

At the census of 1872 the females were found to be slightly in excess of the males, though elsewhere in India the males were returned as largely outnumbering the females. By the recent census the excess of females is not only sustained, but accentuated. In 1872 the females numbered 50·01 per cent. of the total population; in 1881 they numbered 50·20 per cent. In other words, in 1872 there were 99·92 men to every 100 women; in 1881 there were only 99·18 men to every 100 women. This relative increase

in the number of women Mr. Bourdillon regards as evidence of increased accuracy in the returns of the later census. "The error to which census operations in India is most liable," he writes, "is an understating of the female population. National prejudices and a false shame among the upper classes, and among the lower classes a tendency to ignore the existence of their women as not worth returning, combine to produce this result and to reduce the ascertained numbers of the weaker sex below their true figure. But where actual experience of census operations has shown that no evil results follow the enumeration of the females of a household, or when the gradual spread of knowledge has pushed aside the barriers of prejudice and created confidence in the operations of Government, these fancies give way, and the enumerator is enabled, without offending the feelings of the husband or father, to secure accurate statistics for the unnamed women of his house, so that it may be said that in the absence of special causes tending to increase the number of women in the population or reduce that of men, the accuracy of each successive census may be gauged by the increasing proportion which is borne to the whole population by the numbers of females it records. No such special cause can be traced during the nine years which elapsed between the censuses of 1872 and 1881, and it does not, therefore, seem too much to say that the small increase in the proportionate number of females recorded in the census just past is due to the greater accuracy with which the enumeration was carried out; while the fact that there was both in 1872 and 1881 an absolute numerical predominance of females over males is some evidence of the existence of a wider civilisation in Bengal than in other provinces of the empire, where the male outnumbers the female population." It cannot be denied that there is some force in this theory, and it seems to be borne out by a comparison of the figures for the more civilised and the wilder parts of Bengal itself. In the older and more settled parts of the country, known as the regulation districts, the females exceeded the males in 1872 by 137,895, or 0·49 per cent., and in 1881 by 371,361, or 1·24 per cent. But in the more remote parts and in the Feudatory States the males outnumbered the females; though the excess was not so large at the recent census as it was in 1872. Thus in 1872 the males in what may be called the non-regulation districts exceeded the females by 114,909, or 3·09 per cent., and in 1881 by 85,682, or 1·76 per cent. only. In other words a larger proportion of women was returned in 1881 than in 1872, yet the proportion did not come up to that in the regulation districts.

Mr. Bourdillon's report treats of many other topics of statistical

interest, to which it is impossible to do justice in a brief notice like the present. It is understood, moreover, that Mr. Plowden, the Census Commissioner for India, has under preparation a review of all the returns for the different provinces; and the broad survey thus undertaken ought to prove of far greater statistical importance than the examination of the figures for any single province taken alone. Indeed, Mr. Plowden's report cannot fail to throw a flood of light on a variety of social and economic questions in India, and will probably be one of the most valuable State papers ever issued in connection with Her Majesty's Eastern Empire.

MISCELLANEA.

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I.—The Agricultural Returns for the Year 1883.

THE following report on the "Agricultural Returns of Great Britain, with Abstract Returns for the United Kingdom, British Possessions, and Foreign Countries" for the year 1883, is given (with summary tables as before) in continuation of a series of similar notices to be found in the Society's *Journal* for previous years :—

"The annexed tables, containing the usual information comprised in the agricultural returns for the year 1883, are issued for the first time by the newly-constituted Agricultural Department, although they have on this occasion been prepared as hitherto by the officers of the Board of Trade, to whom the best thanks of this department are due for their cordial co-operation in meeting the difficulty and delay which might have arisen through the transfer of so great an addition to the statistical work of the Agricultural Department before arrangements could well be made for the proper compilation of the returns. The data for Great Britain have been collected as usual by officers of the Inland Revenue Department, while the figures for Ireland were supplied by the registrar-general for Ireland. The particulars for the Isle of Man and the Channel Islands, which are included in the general totals, have been collected by officers under the direction of the respective local authorities of those districts. The returns were directed to be obtained in Great Britain, in the Isle of Man, and in the Channel Islands on the 5th of June, and a summary was issued to the newspapers by the Agricultural Department on the 17th of August, subject to corrections in the completed returns. It may be observed that the early issue of the summary depends greatly on the promptitude with which the required information is furnished to the collectors, as no time is lost in preparing it for publication after the information has been received.

"In making the following remarks on the returns now presented, it is proposed to notice, first the chief points suggested by the figures relating to Great Britain, to advert briefly to those for Ireland by comparing the returns for 1883 with those of preceding

years, and to state the causes which are reported by the collectors generally to have led to the various changes.

“ In Great Britain, returns were this year furnished by 554,558 occupiers of land, and 4,842 owners of live stock only, showing an increase of 2,558 occupiers of land, while the number of returns obtained from owners of stock has decreased by 111. The increased number of occupiers is ascribed in many counties chiefly to the subdivision of land, but occasionally to more careful revision of the parish rate books. Allowance must, however, again be made for the numerous cases in which occupiers, who in the previous year made their return in one schedule, have this year returned their several holdings separately. In certain districts it is noticed that the number of holdings has been reduced by changes of occupancy, owing to agricultural depression, small farms being included with larger ones. In other instances the reduction is due to vacant farms being returned by the owners.

“ Reference has been made in former reports to the increased willingness on the part of agriculturists to supply each year the necessary information, instead of leaving the inland revenue officers to make estimates of their own, and to the greater accuracy in the returns resulting therefrom. The returns obtained by estimate show this year, however, a slight increase, the number being 15,970 against 15,595 in 1882, though there is still a diminution if compared with that of 1881. In again acknowledging the trouble taken by those who assist the Government by making actual returns, it may perhaps be worth while to remark that there would be a considerable saving of time if this were universally the practice, and that complete uniformity in the data can only thus be secured. The acreage of the land estimated by the officers in default of returns in 1883 was 1,427,000 compared with 1,453,000 in the previous year, and 1,584,000 in 1881. Of this acreage only about 2 per cent. is in Scotland, where the average size of the holdings, for which recourse is had to estimates, is between 5 and 6 acres only. As has before been pointed out, however, the percentage left to be the subject of estimate is altogether so small that the character of the general results is not affected by it, and it is satisfactory to observe that this percentage continues steadily to diminish.

“ Of the returns which have been obtained the following appear to be the general results:—In Great Britain the area reported in 1883 to be under all kinds of crops, bare fallow, and grass, amounts to 32,385,000 acres, as compared with 32,313,000 acres in the previous year, or an increase of 72,000 acres, which is stated by the collectors to be largely due to the enclosure and reclamation of mountain and heath or waste land in different parts of the country, and in a much smaller degree to greater accuracy in the returns supplied, owing, in some cases to the rectifications of errors occasioned by the use of local measures in the preceding year, and in others to omissions since discovered.

“ In several counties variations occur from land previously in cultivation having been required for the construction of railways, or, in the vicinity of large towns, for building purposes, and

occasionally the variation in acreage is accounted for by farms on the borders being included in the collection of a particular county in one year and in that of another county the next year. There are also variations caused by occupiers, or owners to whom farms have been transferred, having made their returns for the county in which they happen to reside instead of for that in which the land is situate. In one or two counties inferior land is stated to have fallen out of cultivation.

"Of the increased acreage above-mentioned, about 59,000 acres are in England, 7,000 acres in Wales, and 6,000 acres in Scotland. The increase is almost exclusively in permanent pasture, the area under tillage still tending to diminish. The total increase in the ten years since 1873 is no less than 1,282,000 acres.

"With regard to the details of particular crops in Great Britain the most important features to be noticed, as regards corn crops, apart from the decrease in the total, appear to be a considerable diminution of the area under wheat, and an increase in that under barley and oats. The total extent of land returned under wheat in the present year is 2,613,000 acres, or 390,000 acres less than in 1882, and a decrease of 192,000 as compared with the acreage of this crop in 1881, when the breadth sown was less than had previously been recorded. The diminution in the area under wheat in 1883 is almost unanimously stated by the collectors to have been caused by the unsuitable condition of the ground at the proper seed time, owing to the continued heavy rains in the autumn of 1882 and spring of this year. They observe, moreover, that the precarious nature of corn crops in recent years, and the close competition with foreign grain, have further developed the tendency, noticed in previous reports, among farmers to devote more land to grazing purposes as offering better prospects of profitable results, and the returns give ample evidence in support of these statements.

"Estimates proceeding from various sources indicated that in consequence of the unfavourable character of the sowing seasons for the wheat crop of 1883, a considerably decreased acreage must be looked for. The summary issued by the Agricultural Department in August showed that it amounted actually to 13 per cent., and although this is a serious decrease, especially as it is to be feared that the yield will turn out to be less than an average, it is at least satisfactory to find that the figures do not show so large a falling off as was at one time anticipated.

"The area under barley was 2,292,000 acres. This is an increase of about 37,000 acres as compared with 1882, but it is worthy of note that the present year's acreage is less by 146,000 acres than the average of the previous ten years.

"Oats were sown on 2,975,000 acres, being 141,000 in excess of 1882, and a larger breadth than that recorded in any year from 1868. The substitution of oats for wheat is attributed in many reports to the cause already mentioned under the head of wheat, namely, the condition of the soil at sowing time. It is also said that in some districts oats have taken the place of barley, on account of the low price obtainable for the latter grain during the

last two years, probably owing to deterioration in its quality through the unfavourable harvest weather of those years, while oats have proved more remunerative.

"Among minor corn crops, the acreage under rye shows a decrease compared with 1882 of 5,800 acres, and in peas of 7,000 acres, while beans have increased by 11,000 acres. The imports of maize, which compete with these crops, have considerably fallen off, and in 1882 amounted only to about half the quantity imported three years ago. Taking, then, all the figures as to corn crops in Great Britain, we find their total area was 8,618,675 acres, or 214,705 acres short of that in 1882—a decrease of 2·4 per cent., the average area of the preceding ten years having been 9,145,680 acres.

"As regards green crops, potatoes were planted on 543,000 acres, a slight increase over the land so occupied last year. The unprofitable nature of the crop of late years, owing to disease, is stated in some cases to have interfered with its cultivation.

"Turnips and swedes were returned as grown on 2,029,000 acres, against 2,024,000 acres in 1882. Mangold, vetches, and other green crops unenumerated, have, however, declined, making the total area under green crops 3,454,579 acres, or a decrease of 21,000 acres on that of the previous year.

"Flax still occupies but a small acreage in Great Britain, and in 1883 was grown on 4,317 acres only.

"Hops covered 68,000 acres, or an increase of 3·7 per cent. over last year's figures. The result of the failure in the crop picked in 1882 is apparent in the remarkable importation of hops which took place in that year, namely, 319,620 cwt., or 172,000 cwt. more than the quantity imported in 1881, and exceeding that of any year since 1869, while the value of last year's imports was 2,962,631*l.*, or 1,335,690*l.* more than that of any previous year recorded. The return in Table V shows in detail the counties and certain districts in which hops are grown.

"Rather less land was left under bare fallow than in 1882. In some counties, namely, Lincolnshire, Suffolk, and the North Riding of Yorkshire, a noticeable increase has taken place, especially as more uncropped land has been returned in these counties each year since 1878.

"Clover and rotation grasses show a considerable increase, the extent being 4,396,000 acres, or 68,500 more than in 1882. The increase is frequently attributed by the collectors to the better classification made by occupiers generally, in distinguishing between permanent grass and land that is ultimately to be broken up, some of which has been returned by them under the former head in preceding years. In several counties the increase is explained as the result of the necessity of making provision for a greater number of cattle and sheep. The acreage of these crops is, however, much influenced by the character of the seasons.

"The movement in the direction of constant additions to permanent pasture, which has been remarked upon in former reports, continues, and the results are shown this year in an area of 15,065,300 acres, as compared with 14,821,600 in 1882. Although

a part of this increase is attributed to the enclosure of hill and waste land already alluded to, it has also followed as a matter of course from the systematic conversion of arable land to the purposes of rearing cattle and sheep, for which the high prices lately obtainable appear to have offered such inducements. The collectors indeed refer to this and to the uncertainty of the climate for corn growing, as well as to the smaller capital required for farming land thus laid down, as the chief reasons for the marked change in recent years. The land transferred to owners during the recent agricultural depression, and chiefly utilised by them for grazing purposes, has also added its quota towards the result. Ten years ago, grass covered 13,000,000 acres, while arable land has fallen during that period from 18,186,000 to 17,319,000 acres. The proportions of the whole area of cultivated land in 1873 were 41·5 per cent. under permanent pasture, 30·4 per cent. under corn crops, and 11·5 per cent. under green crops. At present, permanent pasture represents 46·5 per cent., corn crops 26·6 per cent., and green crops 10·7 per cent. In reference to the figures relating respectively to the acreage of grass and arable land, it should be remembered, however, that their difference is materially affected by the general reclamation of waste land that is continually going on and which is mainly returned under permanent pasture.

“Orchards in Great Britain have again further increased, their acreage being this year returned as 190,700 acres against 187,500 in 1882. Market gardens likewise show an important increase, namely, from 48,000 to 53,000 acres. The collectors report under both these heads a continually growing demand for fruit and fresh vegetables for the neighbouring towns, which induces many farmers to appropriate land to this produce. From the very large increase in the imports of fruit from abroad, it would appear that there is yet plenty of scope for further efforts in this direction.

“Turning now to the various kinds of live stock in Great Britain there are some encouraging changes to notice. Thus, as regards horned cattle, it is satisfactory to find that the recent falling off in the number has not continued during the present year, the total number now being 5,962,779, or 155,000 more than in 1882. Milch cows in Great Britain have increased in number by 1·7 per cent., and young cattle by 6·7 per cent., but cattle, other than milch cows, of two years of age and above, are 2 per cent. less; the supply of the latter having apparently been overtaken by the demands of the markets, as farmers were tempted to realise upon all they could well spare. In certain counties in Scotland and some localities in England the non-introduction of the usual supply of store cattle from Ireland, owing to local restrictions upon removal and importation on account of foot-and-mouth disease, is said to have partly contributed to this decrease.

“The increase in milking cows is ascribed to the greater attention now paid to dairy farming, in consequence of the remunerative prices obtainable for the produce, the facilities now afforded for transport enabling farmers to forward consignments of milk and butter considerable distances to meet the demand for large towns. The addition to young cattle would appear to have naturally

followed from the increase in cows just noticed ; but the collectors add that it is also attributable to the numbers kept to supply deficiencies created in some districts by the diminution in other classes, and in view of making provision for anticipated demand.

“ In sheep and lambs the numbers also exhibit a satisfactory increase of 748,000, nearly equally distributed between sheep of one year old and above, and sheep under one year, together about 3 per cent. more than last year ; notwithstanding that the collecting officers report that the lambing season, owing to the cold and wet spring, was unfavourable in many of the hilly districts. This was particularly the case in Scotland, where the increase in lambs is but nominal. The winter, however, proved remarkably mild, with abundant food, so that the rate of mortality among sheep was low, and farmers are said to have kept more lambs than usual to replace their previous losses in sheep. It is noticed in some counties that there has been lately less demand for lamb for consumption, and that this has had its influence in the result. A disease called “ the scour ” is referred to as having caused loss in one or two localities.

“ Pigs numbered 2,617,757, against 2,510,402 in 1882, and 2,048,090 in 1881, an increase in 1883 over those years of 4·3 per cent. and 27·8 per cent. respectively. Following closely upon the large increase of last year, a similar advance could hardly have been expected, the numbers indicating that farmers were then fully stocked ; the position, however, is maintained, and it may be observed that the present year's total has only been exceeded in 1867 and in 1872. Swine-fever was more prevalent during the year, and appears to have affected the numbers in some counties, but collectors state generally that pigs are now found profitable to rear, from the high prices obtained owing to the greater demand for home-fed pork and bacon. The recent large decline in the imports of bacon and pork from America tends to confirm this view.

“ Lastly there is an increase of 6,000 in the number of horses used for the purposes of agriculture, while unbroken horses and mares kept solely for breeding have decreased by 9,000.

“ The live stock record of the present year in Great Britain thus exhibits results which may be considered fairly promising, and it is to be hoped that the advance towards the replacing of our losses will be maintained.

“ In the returns of the crops and live stock in Ireland the following changes are to be noticed. The total cultivated area exhibits a decrease, being now 15,151,230 acres, as compared with 15,212,390 in 1882, and 15,304,235 in 1881. The diminution, as in the previous year, extends to corn crops, green crops, flax and rotation grasses. As regards corn crops, wheat was sown only on 94,802 acres, against 152,720 in 1882, a decrease of 58,000 acres, or nearly 38 per cent. Barley shows a decline from 187,805 acres to 184,015 acres, and oats covered only 1,380,871 acres, against 1,397,304 in the preceding year, making altogether with the minor corn crops a total area of 1,678,125 acres against 1,756,819 in 1882.

“ Among green crops we find a decrease under the head of

potatoes, which were planted on 806,664 acres, compared with 837,919 in 1882, and 854,294 in 1881. Turnips occupied 306,767 acres, against 293,978 acres in 1882, the total, with mangold, vetches, and other green crops amounting to 1,230,253 acres, compared with 1,248,954 acres in the previous year, thus leaving a net decrease of nearly 19,000 acres under these crops. Flax was grown on 95,935 acres, being a diminution of 17,000 acres. The land returned under bare fallow was more by 3,400 acres in 1883 than in 1882.

"Clover, sanfoin, and rotation grasses, show a decrease of nearly 31,000 acres, and permanent pasture an increase of 81,000 acres; the area of the latter being now 10,191,118 acres, as against 10,110,079 acres in 1882. It will be seen, however, that the extension of permanent pasture, added to the increased breadth of land under certain crops, does not (contrary to what is the case in Great Britain) suffice to counterbalance the reductions in the acreage of other crops, so that the total cultivated area of Ireland shows a diminution in the past year of 61,160 acres.

"As regards live stock in Ireland, horses have decreased from 482,469 in 1882 to 478,912 in 1883. Milk cows and heifers show a slight increase, other 2 year-old cattle a decrease of 14,625, and young cattle a satisfactory increase of 121,032, making the total number of cattle 4,096,021, or 2·7 per cent. more than last year. Sheep and lambs have both increased, but it may be observed that the numbers are together about 28 per cent. less than those of ten years ago. Pigs on the other hand have decreased from 1,429,930 in 1882 to 1,351,990 in 1883.

"Summing up then, the figures for the whole of the United Kingdom, including the Isle of Man and the Channel Islands, it will be observed that the variations from the returns of last year are unimportant as regards the total cultivated area. Corn and green crops have a less acreage, while rotation grasses have a larger one, and in permanent pasture there is again an important extension, due this year to additions in each division of the United Kingdom. Cattle, sheep, and pigs have on the whole increased notwithstanding the decrease by 78,000 of pigs in Ireland.

"The following table shows a comparison of the principal figures for the United Kingdom, including the Isle of Man and the Channel Islands:—

Acreage.	1883.	1882.	Increase (+) or Decrease (—).
	Acres.	Acres.	Acres.
Total cultivated area.....	47,667,274	47,655,230	+ 12,044
„ of corn crops	10,326,518	10,620,196	— 293,678
„ of green „	4,708,934	4,748,257	— 39,323
„ of clover, &c.	6,371,799	6,333,064	+ 38,735
„ of permanent pasture	25,288,520	24,963,205	+ 325,315
LIVE STOCK.			
	Nos.	Nos.	Nos.
Horses	1,898,745	1,905,317	— 6,572
Cattle	10,097,943	9,832,417	+ 265,526
Sheep	28,347,560	27,448,220	+ 899,340
Pigs	3,986,427	3,956,495	+ 29,932

"The usual table prepared for this report showing the relative course of agriculture in the counties of England, arranged in two divisions of chiefly grazing and corn-growing counties, is here given.

"The grazing, or western, division, includes twenty-one counties:—Northumberland, Cumberland, Durham, Westmoreland, York (North Riding), York (West Riding), Lancaster, Chester, Derby, Stafford, Leicester, Salop, Worcester, Hereford, Monmouth, Gloucester, Wilts, Dorset, Somerset, Devon, and Cornwall.

"The corn or eastern division includes twenty-one counties:—York (East Riding), Lincoln, Nottingham, Rutland, Huntingdon, Warwick, Northampton, Cambridge, Norfolk, Suffolk, Bedford, Bucks, Oxford, Berks, Hants, Hertford, Essex, Middlesex, Surrey, Kent, and Sussex.

"Although the number of the counties is the same in each of these groups the total acreage is larger in the grazing than in the corn division, in the ratio of 53 to 46 per cent. of the total acreage under crops and grass in England.

Acreage under Crops, and Number of Live Stock, in Grazing Counties and in Corn Counties of England, and Percentages of the Totals for England in Grazing and Corn Counties respectively.

	In Grazing Counties.		In Corn Counties.	
	Acreage and Number.	Percentage of Total for England.	Acreage and Number.	Percentage of Total for England.
Total acreage returned under all kinds of crops, bare fallow, and grass.....}	13,259,172	53·5	11,535,887	46·5
Acreage under—				
Wheat	835,482	33·9	1,631,114	66·1
Barley and bere	643,586	33·7	1,268,576	66·3
Oats	896,286	53·5	778,624	46·5
Rye	13,857	34·1	26,776	65·9
Beans.....	106,052	25·1	315,831	74·9
Peas	48,982	20·8	186,602	79·2
Total under above corn crops.....}	2,544,245	37·7	4,207,523	62·3
Potatoes	193,536	57·8	141,431	42·2
Turnips and swedes.....	660,285	45·0	808,456	55·0
Mangold	90,137	28·0	231,558	72·0
Carrots	2,845	24·6	8,710	75·4
Cabbage, kohl-rabi, and rape.	52,606	37·8	86,730	62·2
Vetches, lucerne, &c.	108,145	29·2	262,636	70·8
Clover and other grass under rotation.....}	1,364,882	52·8	1,219,912	47·2
Total under above green crops and grass under rotation.....}	2,472,436	47·3	2,759,433	52·7

Acreage under Crops and Live Stock in Grazing and Corn Counties—Contd.

	In Grazing Counties.		In Corn Counties.	
	Acreage and Number.	Percentage of Total for England.	Acreage and Number.	Percentage of Total for England.
Bare fallow	284,653	39·0	445,916	61·0
Permanent pasture	7,947,085	66·2	4,061,594	33·8
Flax	1,324	31·8	2,834	68·2
Hops	9,429	13·9	58,587	86·1
Orchards, &c.	138,658	74·6	47,121	25·4
Woods, &c.	*761,892	52·0	*704,146	48·0
Number of horses used solely for agriculture	375,627	48·3	402,552	51·7
Number of horses unbroken and mares for breeding	171,573	56·2	133,827	43·8
Number of cattle.....	2,765,311	65·6	1,451,314	34·4
" sheep	8,178,153	52·4	7,416,207	47·6
" pigs	1,093,870	49·0	1,137,325	51·0

* As returned in 1881.

Acreage of each Description of Crop in Grazing and Corn Counties of England, and Percentage of Total Cultivated Acreage in each Division under each Description of Crop.

	In Grazing Counties.		In Corn Counties.	
	Acreage.	Percentage of Total Cultivated Acreage in the Division.	Acreage.	Percentage of Total Cultivated Acreage in the Division.
Acreage under—				
Corn crops	2,544,245	19·2	4,207,523	36·5
Green "	1,107,554	8·4	1,539,521	13·3
Clover and other grass under rotation	1,361,882	10·3	1,219,912	10·6
Bare fallow	284,653	2·1	415,916	3·9
Permanent pasture	7,947,085	59·9	4,061,594	35·2
Flax	1,324	0·0	2,834	0·0
Hops	9,429	0·1	58,587	0·5
Total	13,259,172	100·0	11,535,887	100·0

"A comparison of some of the results in the table for 1883 and those published in 1881 and 1882 shows a few slight variations which it may be desirable to notice. Thus in the acreage under corn crops the percentage proportion of the total for England in the grazing counties is now 37·7 against 38·1 last year, and 37·9 in 1881. Wheat is this year 33·9 in those counties compared with 35·3 in 1882 and 35·1 in 1881. Potatoes have increased in the corn counties, where the proportionate percentage is this year 42·2

against 41·2 in 1882, and 40·8 in 1881. There are also other small differences in certain green crops, but the total acreage under green crops and rotation grasses has nearly the same distribution as last year. In bare fallow there is an increase in the grazing counties, and the percentage in these counties is now 39·0 against 38·7 in 1882. The decreased acreage in flax is chiefly in the corn counties, the percentage there being this year 68·2 as compared with 71·1 last year.

"In live stock there is again but little difference, but the proportionate number of pigs has varied, the corn counties having this year 51·0 per cent. as compared with 49·7 in 1882, and the grazing counties 49·0 against 50·3.

"Comparative tables have been added according to the practice of the last four years, showing the imports of certain kinds of food, the prices of agricultural produce and other appropriate particulars for a series of years. Further, with a view of increasing the usefulness and interest of the returns, it has been considered desirable to re-introduce tables relating to the crops and live stock in British possessions and in foreign countries, such as were formerly included among these returns, but have lately been published in the respective statistical abstracts issued by the Board of Trade, to the courtesy of whose officers the Agricultural Department is this year indebted for the information supplied.

"The tables showing the extent of the agricultural resources in the various British possessions, compiled from the official returns of such as publish agricultural statistics, are given after those of Great Britain. There are not at present any available returns relating to the agricultural condition of our important dominions in India, although, considering the greatly increased supplies of wheat obtained thence of late years, periodical statistics would be of much interest. The absence of annual returns of this description from the Dominion of Canada prevents further particulars than those furnished in the report for 1882 being given.

"The most complete and regular returns are those of the several Australasian colonies, for which the tables show the progressive increase in cultivation from 1867. The quantity of land under wheat in the year 1882-83 in each of the following colonies was:—In South Australia, 1,746,500 acres; in Victoria, 969,300 acres; in New Zealand, 390,800 acres; in New South Wales, 247,300 acres; in Queensland, 10,500 acres; in Tasmania, 46,700 acres; and in Western Australia, 22,700 acres. The total area under barley in those colonies amounted to 99,000 acres only. Oats covered 170,000 acres in Victoria and 320,000 acres in New Zealand. Returns for the same year, as to the area under maize in New South Wales and Queensland, where this kind of corn is chiefly grown, show an acreage of 118,000 acres for the former, and 53,000 acres for the latter colony. The produce of the wheat crop in six of these colonies (omitting Western Australia, for which it is not stated) amounted in the aggregate to 31,513,000 bushels, or an average of about $9\frac{1}{4}$ bushels to the acre. Of this quantity South Australia produced 7,356,100 bushels, or only about $4\frac{1}{4}$ bushels per acre; Victoria, 8,751,400 bushels, or 9 bushels per

acre; New Zealand, 10,270,600 bushels, or 26 bushels per acre; New South Wales, 4,042,400 bushels, or 16 bushels per acre; Queensland, 145,700 bushels, or nearly 14 bushels per acre; and Tasmania, 946,900 bushels, or 20 bushels per acre. The yield of oats in the same year was 4,446,000 bushels in Victoria, and 10,520,400 in New Zealand, or an average of 26 and 33 bushels respectively per acre. The produce of maize in New South Wales and Queensland together amounted to 5,480,300 bushels, or an average of 32 bushels per acre. Potatoes were grown on 89,000 acres in the six first-mentioned colonies, producing nearly 4 tons to the acre, the highest average yield, that of New Zealand, being 5 tons.

"There is but little change in the acreage of land under vineyards in Australia in recent years.

"As regards live stock in Australasia, the returns for which command interest in view of the possible further supply of meat to this country, should success ultimately attend the experimental processes now being tried for the transport of dead meat, the figures in Tables 32—35 show that, in 1882, as compared with the preceding year, the aggregate numbers of horses, of horned cattle, and of sheep have respectively increased, while the number of pigs has considerably declined.

"Comparing the numbers of 1882 with those of 1872, it appears that there were altogether in the whole of these colonies 1,219,000 horses in 1882 against 820,000 in 1872. Horned cattle had increased to 8,429,000 from 5,038,000 ten years previously, and the number of sheep, in which the wealth of these countries is more marked than in any other kind of live stock, amounted in the aggregate to 76,008,000 in 1882, against 51,508,000 in 1872. It is also satisfactory to observe that in Victoria and Queensland the losses in sheep occasioned by drought in 1878 had, in 1882, been repaired.

"The imports of wool from Australia have, during the decennial period 1872-82, increased from 173,201,712 lbs. to 345,784,446 lbs.

"Following the tables relating to the several British colonies are returns containing the latest statistics available for various foreign countries as to the acreage of crops and their estimated yield, with the number of live stock of each kind. They do not, unfortunately, afford exact comparison of the quantities of particular crops produced in the several countries, owing to the difference in the years for which the figures are given, but so far as is at present practicable, they show the results of agriculture in those parts of the world. From the details it would appear that the average yield of wheat per acre in Great Britain is much above the average yield of that crop in any foreign country.

"With respect to the United States, the latest reports state that the increased acreage of winter wheat first sown will not compensate for the loss of area caused by the ploughing up of winter-killed wheat which was subsequently replaced by oats, maize, or other spring crops. The returns of spring-sown wheat, which occupies usually from 25 to 30 per cent. of the entire area under wheat, show an average estimated increase of 5 per cent. or

about half a million acres. The condition of the crop, winter and spring wheat together, indicated a yield of at least 11 bushels per acre, or 418,000,000 bushels. There would be, therefore, as compared with 1882, an estimated deficiency in the aggregate wheat product of the present year of about 86,000,000 bushels.

"Maize, which covered 65,659,546 acres last year shows an estimated increased area of over 2,000,000 acres, a large portion of the breadth sown being due to the replanting of extensive areas of winter-killed wheat. The condition of the crop, owing to drought and frosts in the early part of September was, however, not so good as had been anticipated, and as the crop would be late, it did not promise a yield of more than about 23 bushels per acre or about 1,600,000,000 bushels, substantially the same quantity as in 1882. The total acreage under barley has increased by about $3\frac{1}{2}$ per cent., being estimated at 2,350,000 acres, with a possible yield of 22 bushels per acre. Oats have increased by about 4 per cent., occupying this year nearly 19,200,000 acres, and the condition of the crop was high, indicating a yield of 28 bushels to the acre. No information as to the acreage of rye this year is given. In 1882 the breadth was 2,227,889 acres.

"The yield of wheat in 1882 was 504,185,470 bushels from 37,067,194 acres, or 13.6 bushels per acre, that of maize being 1,617,025,100 bushels or 24.6 bushels per acre. Of other corn crops the yields were:—barley, 48,953,926 or 21.5 bushels per acre; oats, 488,250,610 or 26.4 bushels per acre, and rye, 29,960,037 or 13.4 bushels to the acre.

"Returns as to the yield of all these crops for 1883 will not be received till later in the year.

"The reports received from the Department of Agriculture at Washington, referring to the deficiency in the wheat product for this year and to prospective requirements, stated that, as there was an estimated surplus on 1st August, greater by 40,000,000 bushels than the surplus of the previous year, an ample supply would remain to meet the demands for home consumption and those of an average exportation.

"From the latest returns of live stock it appears that there were in the United States, in 1882, horses 10,838,111; mules 1,871,079; cattle 41,171,762; sheep and lambs 49,237,291; and pigs 43,270,086. Showing in each description of live stock, except pigs, an important increase as compared with the respective figures for 1881.

"In connection with the question of the relative numbers of live stock in different countries likely to be available for the supply of meat to this country, it appeared desirable to ascertain definitely the probable average weight of each description of animal imported from the countries whence we usually derive supplies. Estimates have accordingly been obtained from reliable sources as to the respective average weight of cattle, sheep, and pigs, imported from these countries, when killed for meat. The average weight so estimated in stones of 8 lbs. is here stated for each country and class of animal:—Belgium, sheep $8\frac{3}{4}$ stones; Denmark, cattle 70 stones, sheep 8; France, cattle $103\frac{1}{2}$, sheep 7;

Schleswig-Holstein, cattle 85, sheep $8\frac{3}{4}$; Netherlands, cattle 85, calves $16\frac{1}{2}$, sheep $8\frac{3}{4}$; Norway and Sweden, cattle 78, sheep 6; Portugal, cattle $86\frac{1}{2}$; Spain, cattle 71; Canada, cattle 90, sheep $8\frac{1}{2}$; United States of America, cattle 101, sheep $7\frac{1}{2}$. Of pigs, the average weight from those countries from which they are now brought in important numbers appears to be 14 stones.

“It would also be obviously desirable to have returns of the number and average weight of home-bred animals annually slaughtered for consumption. No satisfactory means have however yet been found whereby to procure such returns of sufficient fulness and accuracy, or otherwise than at a cost in money, and in annoyance to those concerned, which the results obtainable would fail to justify.

“It will be noticed that in these tables the United Kingdom is the only country for which the yield of the several corn crops is not stated. It has not been practicable this year to obtain sufficient information in time for this report, but, with a view of remedying the deficiency, it is hoped that arrangements may be made by which a system of fairly trustworthy statistics may be established for the future.”

APPENDIX.

TABLE A.—*Total Area and Acreage under each kind of Crop, Bare Fallow, and Grass and 1882, in each Division of Great Britain, with similar*

	England.		Wales.		Scotland.	
	1883.	1882.	1883.	1882.	1883.	1882.
TOTAL AREA AND ACREAGE UNDER COEN CROP						
	Aeres.	Aeres.	Aeres.	Aeres.	Aeres.	Aeres.
Total area	32,597,	32,597,	4,722,	4,722,	19,467,	19,167,
„ acreage under crops, bare fallow, and grass ..	24,795,	24,736,	2,800,	2,793,	4,790,	4,784,
Corn Crops—						
Wheat.....	2,467,	2,829,	78,	95,	68,	79,
Barley or bere	1,912,	1,858,	134,	135,	246,	262,
Oats	1,675,	1,533,	255,	251,	1,046,	1,049,
Rye	41,	47,	2,	2,	8,	8,
Beans	422,	409,	3,	3,	23,	25,
Peas	236,	243,	2,	2,	2,	2,
Total of corn crops	6,752,	6,919,	475,	489,	1,392,	1,425,
Green Crops—						
Potatoes.....	335,	332,	40,	42,	169,	167,
Turnips and swedes.....	1,469,	1,463,	70,	68,	490,	494,
Mangold.....	322,	326,	7,	7,	2,	1,
Carrots	12,	12,	1,	—	1,	1,
Cabbage, kohlrabi, and rape	139,	143,	1,	1,	5,	5,
Vetches and other green crops, except clover or } grass	371,	389,	6,	7,	16,	18,
Total of green crops.....	2,647,	2,665,	124,	124,	684,	687,
Clover, sanfoin, and grasses under rotation	2,585,	2,516,	309,	314,	1,502,	1,467,
Permanent pasture or grass not broken up in rota- } tion (exclusive of heath or mountain land)..... }	12,000,	11,801,	1,865,	1,837,	1,191,	1,184,
Flax.....	4,	5,	—	—	—	—
Hops	68,	66,	—	—	—	—
Bare fallow or uncropped arable land	731,	735,	27,	29,	21,	21,
NUMBER OF LIVE STOCK, AS RETURNED						
Horses (including ponies), as returned by occupiers of land—						
Used solely for purpose of agriculture, &c.	778,	772,	74,	73,	143,	143,
Unbroken horses and mares kept solely for breeding	305,	312,	65,	65,	45,	47,
Total of horses	1,084,	1,084,	139,	138,	188,	191,
Cattle—						
Cows and heifers in milk or in calf	1,651,	1,618,	260,	260,	395,	390,
Other cattle—						
2 years of age and above.....	1,010,	1,027,	107,	116,	252,	263,
Under 2 years of age	1,556,	1,437,	285,	268,	447,	460,
Total of cattle	4,217,	4,082,	652,	645,	1,094,	1,081,
Sheep—						
1 year old and above	9,620,	9,313,	1,767,	1,745,	4,553,	4,516,
Under 1 year old	5,966,	5,635,	814,	773,	2,330,	2,284,
Total of sheep	15,586,	14,948,	2,581,	2,518,	6,883,	6,800,
Pigs	2,231,	2,123,	230,	234,	157,	154,

* From Returns prepared by the Registrar-General for Ireland, and laid before Parliament.

APPENDIX.

*and Number of Horses, Cattle, Sheep, and Pigs, as returned upon the 5th June, 1883
Particulars for Ireland,* and with Total for United Kingdom.* [000's omitted.]

Great Britain.		Ireland.		United Kingdom, including Isle of Man and Channel Islands.	
1883.	1882.	1883.	1882.	1883.	1882.
CORN CROPS, BARE FALLOW, GRASS, &c.					
Ares.	Acres.	Acres.	Ares.	Acres.	Acres.
1,786, 385.	56,786, 32,313.	20,820, 15,151.	20,820, 15,212.	77,800, 47,667.	77,800, 47,655.
1,613, 292, 4,975, 51, 448, 239.	3,004, 2,255, 2,834, 57, 437, 247.	95, 184, 1,381, 7, 10, 1.	153, 188, 1,397, 8, 10, 1.	2,713, 2,486, 4,370, 58, 458, 241.	3,164, 2,452, 4,249, 64, 447, 248.
1,619.	8,838.	1,678.	1,757.	10,327.	10,620.
543, 629, 330, 13, 146, 393.	541, 2,024, 334, 13, 150, 413.	807, 307, 138, 43, 41, 34.	835, 294, 136, 43, 43, 35.	1,360, 2,346, 369, 17, 188, 429.	1,358, 2,329, 371, 17, 193, 450.
455.	3,476.	1,230.	1,249.	4,709.	4,748.
396.	4,327.	1,931.	1,962.	6,372.	6,333.
665.	14,822.	10,191.	10,110.	25,289.	24,963.
4, 68, 778.	5, 66, 784.	96, —, 25.	114, —, 21.	100, 68, 803.	119, 66, 806.
Total area " acreage under crops, bare fallow, and grass					
Corn Crops—					
Wheat					
Barley or bere					
Oats					
Rye					
Beans					
Peas					
Total of corn crops					
Green Crops—					
Potatoes					
Turnips and swedes					
Mangold					
Carrots					
Cabbage, kohlrabi, and rape					
Vetches and other green crops, except clover or grass					
Total of green crops					
Clover, sanfoin, and grasses under rotation					
Permanent pasture or grass not broken up in rotation (exclusive of heath or mountain land)					
Flax					
Hops					
Bare fallow or uncropped arable land					
ON THE 5TH JUNE, 1883 AND 1882.					
995, 416.	989, 423.	479.	482.	1,899.	1,905.
411.	1,414.	479.	482.	1,899.	1,905.
1,366.	2,267.	1,402.	1,399.	3,725.	3,682.
366.	1,396.	861.	876.	2,235.	2,277.
288.	2,144.	1,833.	1,712.	4,139.	3,873.
993.	5,807.	4,096.	3,987.	10,098.	9,832.
949.	15,574.	1,985.	1,934.	17,966.	17,539.
127.	5,746.	1,234.	1,188.	10,381.	9,909.
68.	24,320.	3,219.	3,071.	28,348.	27,448.
618.	2,510.	1,352.	1,430.	3,956.	3,956.
Horses (including ponies), as returned by occupiers of land— Used solely for purpose of agriculture, &c. Unbroken horses and mares kept solely for breeding					
Total of horses					
Cattle— Cows and heifers in milk or in calf Other cattle— 2 years of age and above Under 2 years of age					
Total of cattle					
Sheep— 1 year old and above Under 1 year old					
Total of sheep					
Pigs					

† Including beet root.

‡ Including parsnips.

TABLE B.—Percentage of Total Cultivated Acreage under Various Kinds of Crops, and Number of each Kind of Live Stock to every 100 Acres

	England.		Wales.		Scotland.	
	1883.	1882.	1883.	1882.	1883.	1882.
PERCENTAGE OF TOTAL CULTIVATED ACREAGE						
Corn crops (including beans and peas)	27·2	28·0	17·0	17·5	29·1	29·8
Green crops	10·7	10·8	4·4	4·5	14·3	14·4
Bare fallow	3·0	2·9	1·0	1·0	0·4	0·4
Grass—						
Clover, &c., under rotation	10·4	10·3	11·0	11·2	31·3	30·7
Permanent pasture	48·4	47·7	66·6	65·8	24·9	24·7
Other crops	0·3	0·3	0·0	0·0	0·0	0·0
Total	100·0	100·0	100·0	100·0	100·0	100·0
PERCENTAGE OF TOTAL ACREAGE OF CORN CROPS						
Wheat	36·6	40·9	16·5	19·5	4·9	5·6
Barley or bere	28·3	26·8	28·3	27·7	17·6	18·4
Oats	24·8	22·2	53·6	51·3	75·1	73·6
Rye	0·6	0·7	0·5	0·4	0·6	0·6
Beans	6·2	5·9	0·6	0·6	1·7	1·7
Peas	3·5	3·5	0·5	0·5	0·1	0·1
Total	100·0	100·0	100·0	100·0	100·0	100·0
PERCENTAGE OF TOTAL ACREAGE OF GREEN CROPS						
Potatoes	12·7	12·5	32·0	33·5	24·7	24·3
Turnips and swedes	55·4	54·9	56·4	54·4	71·7	71·9
Mangold	12·2	12·2	5·4	5·3	0·2	0·2
Carrots	0·4	0·4	0·4	0·3	0·2	0·2
Cabbages, kohl-rabi, and rape	5·3	5·4	1·1	1·0	0·8	0·8
Vetches, lucerne, and any other green crop, except clover or grass	14·0	14·6	4·7	5·5	2·4	2·7
Total	100·0	100·0	100·0	100·0	100·0	100·0
NUMBER OF EACH KIND OF LIVE STOCK TO EVERY 100 ACRES						
Horses	4·4	4·4	5·0	4·9	3·9	4·1
Cattle	17·0	16·5	23·3	23·1	22·8	22·7
Sheep	62·9	60·4	92·2	90·1	143·9	143·7
Pigs	9·0	8·6	8·2	8·4	3·3	3·1

TABLE C.—*Total Acreage under Crops, Bare Fallow, and Grass; and Acreage under Crops, Bare Fallow, and Grass (Land), in England, Wales, and Scotland*

	1872.	1873.	1874.	1875.	1876.	1877
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Total Acreage under—						
Crops, Bare Fallow, and Grass—						
England	23,830,197	23,893,558	24,008,368	24,112,309	24,201,622	24,312,300
Wales	2,635,642	2,647,080	2,678,730	2,696,143	2,712,097	2,731,900
Scotland	4,538,334	4,561,982	4,579,821	4,607,898	4,637,893	4,669,100
Total	31,004,173	31,102,620	31,266,919	31,416,350	31,551,612	31,712,300
Corn Crops—						
England	7,576,698	7,501,713	7,505,076	7,528,543	7,288,186	7,302,720
Wales	561,916	536,786	516,001	512,178	498,968	494,700
Scotland	1,434,937	1,420,429	1,410,413	1,410,929	1,407,515	1,411,700
Total	9,573,551	9,458,928	9,431,490	9,451,650	9,194,669	9,210,000
Green Crops—						
England	2,778,925	2,749,318	2,764,182	2,848,473	2,752,434	2,757,700
Wales	136,065	133,232	131,956	131,085	129,466	123,300
Scotland	701,393	693,936	685,132	684,549	689,974	693,300
Total	3,616,383	3,576,486	3,581,270	3,664,107	3,571,874	3,580,000
Clover, &c.—						
England	2,822,392	2,678,311	2,618,655	2,608,106	2,787,103	2,738,500
Wales	370,850	360,555	365,078	360,596	360,159	371,000
Scotland	1,320,209	1,327,952	1,357,009	1,385,369	1,393,011	1,400,000
Total	4,513,451	4,366,818	4,340,742	4,354,071	4,540,273	4,510,000
Total Acreage of—						
Arable Land—						
England	13,839,369	13,655,744	13,570,219	13,576,026	13,512,993	13,407,720
Wales	1,103,758	1,065,495	1,045,188	1,029,830	1,014,151	980,000
Scotland	3,485,440	3,465,452	3,473,500	3,497,873	3,508,524	3,510,000
Total	18,428,567	18,186,691	18,088,907	18,103,729	18,035,668	17,900,000
Permanent Pasture—						
England	9,990,828	10,237,814	10,438,149	10,536,283	10,688,629	10,810,000
Wales	1,531,884	1,581,585	1,633,542	1,666,313	1,697,946	1,720,000
Scotland	1,052,894	1,096,530	1,106,321	1,110,025	1,129,369	1,130,000
Total	12,575,606	12,915,929	13,178,012	13,312,621	13,515,944	13,660,000

Cereals, Green Crops, Clover, &c., and Permanent Pasture (exclusive of Heath and Mountain) in each Year from 1872 to 1883 inclusive.

1878.	1879.	1880.	1881.	1882.	1883.	
Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	
24,736,815	24,503,882	24,596,266	24,663,937	24,736,192	24,795,059	Total Acreage under—
2,465,511	2,758,743	2,767,516	2,784,963	2,793,346	2,799,994	Crops, Bare Fallow,
400,206	4,713,159	4,738,127	4,762,612	4,783,833	4,790,032	and Grass—
1,453,2	31,975,784	32,101,909	32,211,512	32,313,371	32,385,085	England
						Wales
						Scotland
						Total
						Corn Crops—
7,481,1	7,113,122	6,993,699	6,960,958	6,919,320	6,751,768	England
1,868	481,577	478,116	482,315	488,890	474,775	Wales
100,967	1,390,535	1,403,887	1,404,703	1,425,170	1,392,132	Scotland
957,646	8,985,234	8,875,702	8,847,976	8,833,380	8,618,675	Total
						Green Crops—
230,983	2,736,488	2,659,134	2,681,953	2,664,522	2,647,075	England
22,708	126,951	120,073	124,550	124,447	123,927	Wales
37,319	690,579	697,446	704,065	686,691	683,577	Scotland
3,1,010	3,554,318	3,476,653	3,510,568	3,475,660	3,454,579	Total
						Clover, &c.—
235,097	2,674,949	2,646,241	2,548,952	2,546,272	2,584,794	England
56,486	347,473	332,353	331,401	314,204	309,124	Wales
131,524	1,450,951	1,455,745	1,461,932	1,466,916	1,502,004	Scotland
473,107	4,473,373	4,434,339	4,342,285	4,327,392	4,395,922	Total
						Total Acreage of—
						Arable Land—
13,38,235	13,270,356	13,134,410	13,008,112	12,935,464	12,786,380	England
8,310	984,932	961,766	969,550	956,289	934,588	Wales
36,691	3,553,772	3,578,774	3,590,453	3,599,943	3,598,744	Scotland
17,3,236	17,809,060	17,674,950	17,568,115	17,491,696	17,319,712	Total
						Permanent Pasture—
109,580	11,233,526	11,461,856	11,655,825	11,800,728	12,008,679	England
18,201	1,773,811	1,805,750	1,815,413	1,837,057	1,865,406	Wales
153,515	1,159,387	1,159,353	1,172,159	1,183,890	1,191,288	Scotland
13,1,296	14,166,724	14,426,959	14,643,397	14,821,675	15,065,373	Total

TABLE D.—Summary of Total Acreage under each Principal Crop, and of the Number

		1872.	1873.	1874.	1875.	1876.	187
<i>Principal Crops.</i>		Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Wheat....	England	3,336,888	3,252,802	3,391,440	3,128,547	2,823,342	2,987,900
	Wales	126,367	116,852	117,869	111,797	94,423	100,600
	Scotland	135,702	120,726	120,991	102,137	78,192	81,150
	Great Britain	3,598,957	3,490,380	3,630,300	3,342,481	2,995,957	3,169,650
Barley or Bere	England	1,896,403	1,926,183	1,889,722	2,090,423	2,109,265	2,000,100
	Wales	168,014	163,613	152,425	154,444	153,647	147,200
	Scotland	251,915	246,117	245,840	264,834	270,197	269,500
	Great Britain	2,316,332	2,335,913	2,287,987	2,509,701	2,533,109	2,417,800
Oats.....	England	1,442,075	1,419,128	1,356,739	1,421,951	1,534,249	1,489,000
	Wales	256,074	244,893	235,621	237,170	242,417	239,000
	Scotland.....	1,007,688	1,012,206	1,004,024	1,004,888	1,021,764	1,024,320
	Great Britain	2,705,837	2,676,227	2,596,384	2,661,009	2,798,430	2,752,320
Potatoes	England	339,056	309,419	314,571	320,477	305,429	303,740
	Wales	48,417	44,936	45,379	44,505	42,581	42,120
	Scotland.....	176,615	160,327	160,480	157,671	154,709	163,350
	Great Britain	564,088	514,682	520,430	522,653	502,719	512,710
Turnips and Swedes	England	1,512,496	1,510,307	1,560,857	1,569,049	1,561,116	1,495,850
	Wales.....	69,185	70,821	70,843	70,326	72,049	70,150
	Scotland.....	501,826	510,780	501,636	503,323	512,408	506,570
	Great Britain	2,083,507	2,121,908	2,133,336	2,142,698	2,145,573	2,072,550
Clover, &c., under Rotation	England	2,822,392	2,678,311	2,618,655	2,608,106	2,787,103	2,737,570
	Wales	370,850	360,555	365,078	360,596	360,159	351,070
	Scotland.....	1,320,209	1,327,952	1,357,009	1,385,369	1,393,011	1,402,320
	Great Britain	4,513,451	4,366,818	4,340,742	4,354,071	4,540,273	4,490,960
<i>Live Stock.</i>		No.	No.	No.	No.	No.	No.
Cattle	England	3,901,663	4,173,635	4,305,440	4,218,470	4,076,410	3,975,500
	Wales.....	602,738	642,857	665,105	651,274	636,644	616,000
	Scotland.....	1,120,593	1,148,057	1,154,846	1,143,080	1,131,087	1,110,700
	Great Britain	5,624,994	5,964,549	6,125,491	6,012,824	5,844,141	5,692,200
Sheep	England	17,912,904	19,169,851	19,859,758	19,114,634	18,320,091	18,330,770
	Wales	2,867,144	2,966,862	3,064,696	2,951,810	2,873,141	2,861,100
	Scotland.....	7,141,459	7,290,922	7,389,487	7,100,994	6,989,719	6,967,700
	Great Britain	27,921,507	29,427,635	30,313,941	29,167,438	28,182,951	28,159,570
Pigs*	England	2,347,512	2,141,417	2,058,781	1,875,357	1,924,033	2,115,500
	Wales	238,317	211,174	213,754	203,348	215,488	232,200
	Scotland.....	185,920	147,668	150,297	151,213	154,099	155,500
	Great Britain	2,771,749	2,500,259	2,422,832	2,229,918	2,293,620	2,493,200

* Exclusive of those kept in towns and

Live Stock returned in Great Britain, in each Year from 1872 to 1883 inclusive.

1878.	1879.	1880.	1881.	1882.	1883.		
Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	<i>Principal Crops.</i>	
041,241	2,718,992	2,745,733	2,641,045	2,829,491	2,466,596	England	} Wheat
101,813	94,639	89,729	90,026	95,387	78,394	Wales	
75,363	76,613	73,976	74,738	79,082	68,172	Scotland	
218,417	2,890,244	2,909,438	2,805,809	3,003,960	2,613,162	Gt. Britain	
062,498	2,236,101	2,060,807	2,029,499	1,857,542	1,912,162	England	} Barley or Bere
148,116	152,491	142,514	142,318	135,493	134,281	Wales	
259,038	278,584	264,120	270,517	262,234	245,548	Scotland	
469,652	2,667,176	2,467,441	2,442,334	2,255,269	2,291,991	Gt. Britain.	
430,376	1,425,126	1,520,125	1,627,004	1,533,452	1,674,910	England	} Oats
234,986	226,967	239,526	243,544	251,033	254,522	Wales	
033,545	1,004,535	1,037,254	1,030,727	1,049,380	1,045,949	Scotland	
698,907	2,656,628	2,796,905	2,901,275	2,833,865	2,975,381	Gr. Britain	
301,852	323,992	324,931	347,783	332,243	334,967	England	} Potatoes
40,816	42,609	38,940	42,440	41,674	39,694	Wales	
165,763	174,743	187,061	189,161	167,147	168,794	Scotland	
508,431	541,344	550,932	579,334	541,064	543,455	Gt. Britain	
466,973	1,457,762	1,473,030	1,478,682	1,462,824	1,468,741	England	} Turnips and Swedes
67,531	67,349	65,190	66,356	67,695	69,578	Wales	
497,356	491,964	485,987	490,604	493,807	490,307	Scotland	
031,860	2,017,075	2,024,207	2,035,642	2,024,326	2,028,926	Gt. Britain	
785,097	2,674,949	2,646,241	2,548,952	2,545,272	2,584,794	England	} Clover, &c., under Rotation
356,486	347,473	332,353	331,401	314,204	309,121	Wales	
431,524	1,450,951	1,455,745	1,461,932	1,466,916	1,502,004	Scotland	
573,107	4,473,373	4,434,339	4,342,285	4,327,392	4,395,922	Gt. Britain	
No.	No.	No.	No.	No.	No.	<i>Live Stock.</i>	
034,552	4,128,940	4,158,046	4,160,085	4,081,735	4,216,625	England	} Cattle
608,189	643,815	654,714	655,345	644,510	651,537	Wales	
095,387	1,083,601	1,099,286	1,096,212	1,081,246	1,094,317	Scotland	
738,128	5,856,356	5,912,046	5,911,642	5,807,491	5,962,779	Gt. Britain	
144,004	18,445,522	16,828,646	15,382,856	14,947,994	15,594,660	England	} Sheep
925,806	2,873,460	2,718,316	2,466,945	2,517,914	2,551,250	Wales	
036,396	6,838,098	7,072,088	6,731,252	6,853,860	6,892,361	Scotland	
406,206	28,157,080	26,619,050	24,581,053	24,319,768	25,068,271	Gt. Britain	
124,722	1,771,081	1,697,914	1,733,280	2,122,625	2,231,195	England	} Pigs*
218,337	192,757	182,003	191,792	233,694	229,964	Wales	
140,189	127,721	120,925	123,018	154,083	156,598	Scotland	
483,248	2,091,559	2,000,842	2,048,090	2,510,402	2,617,757	Gt. Britain	

*taggers with less than a quarter of an acre of land.

TABLE E.—Quantities and Values of Manures Imported into the United Kingdom in each of the Years from 1863 to 1882 inclusive.

Year.	Quantities.				Values.			
	Bones of Animals and Fish for Manure only.	Guano.	Unenumerated.	Total.	Bones of Animals and Fish for Manure only.	Guano.	Unenumerated.	Total.
	Tons.	Tons.	Tons.	Tons.	£	£	£	£
1863....	65,404	233,574	7,020	305,998	348,425	2,658,856	21,977	3,029,258
'64....	60,828	131,358	8,692	200,878	345,369	1,457,088	78,289	1,880,746
'65....	65,642	237,393	9,590	312,625	362,624	2,675,995	52,279	3,090,898
'66....	72,878	135,697	8,433	217,008	356,853	1,439,679	34,509	1,831,041
'67....	73,262	192,308	5,570	271,140	368,981	2,109,506	18,912	2,497,399
'68....	70,546	182,343	6,474	259,363	381,618	2,039,478	15,822	2,436,918
69....	90,604	210,010	8,624	309,238	546,645	2,640,983	22,704	3,210,332
'70....	92,032	280,311	24,761	397,104	591,701	3,476,680	77,457	4,145,838
'71....	92,878	178,808	80,264	351,950	596,266	1,986,989	276,949	2,860,204
'72....	97,644	118,704	131,936	348,284	642,813	1,201,042	420,739	2,264,594
'73....	70,055	184,420	92,420	346,895	457,432	2,103,531	297,675	2,858,638
'74....	83,413	112,429	139,728	335,600	549,125	1,348,849	394,441	2,292,415
'75....	97,217	114,454	190,889	402,560	630,656	1,293,436	499,213	2,423,305
'76....	85,129	199,291	204,707	489,127	524,769	2,295,744	543,165	3,363,678
'77....	104,740	152,989	225,273	483,002	666,555	1,665,127	661,670	2,993,352
'78....	86,620	177,793	252,593	517,006	542,386	1,806,573	760,227	3,109,186
'79....	64,238	77,015	215,344	356,597	365,772	704,448	641,457	1,711,677
'80....	78,138	80,497	192,040	350,675	436,186	810,177	537,279	1,783,642
'81....	65,180	50,505	262,109	377,794	382,316	491,327	692,158	1,565,801
'82....	54,420	44,952	321,324	420,696	353,043	388,467	903,632	1,645,142

TABLE F.—*Population* of the United Kingdom and Value of Imports of Live Stock, Corn and Grain, and various Kinds of Dead Meat and Provisions† in each of the Years 1863 to 1882, and Proportion per Head of Population.*

Years.	Population* of the United Kingdom, Estimated at the middle of each Year.	Imports.				
		Live Cattle, Sheep, and Pigs.	Corn, Grain, and Flour.	Dead Meat and Provisions.†	Total.	Value per Head of Population.
	No.	£	£	£	£	£ s. d.
1863....	29,433,918	2,655,072	25,956,520	10,841,324	39,452,916	1 6 10
'64....	29,628,578	4,275,322	19,882,181	12,157,010	36,314,513	1 4 6
'65....	29,861,908	6,548,413	20,725,483	12,667,838	39,941,734	1 6 9
'66....	30,076,812	5,839,058	30,049,655	13,483,715	49,372,428	1 12 10
'67....	30,334,999	4,148,382	41,368,349	12,489,331	58,006,062	1 18 3
'68....	30,617,718	2,698,496	39,432,624	13,277,683	55,408,803	1 16 2
'69....	30,913,513	5,299,087	37,351,089	15,189,933	57,840,109	1 17 5
'70....	31,205,444	4,654,905	34,170,221	14,773,712	53,598,838	1 14 4
'71....	31,513,442	5,663,150	42,691,464	16,593,668	64,948,282	2 1 3
'72....	31,835,757	4,394,850	51,228,816	18,604,273	74,227,939	2 6 8
'73....	32,124,598	5,418,584	51,737,811	23,854,967	81,011,362	2 10 5
'74....	32,426,369	5,265,041	51,070,202	25,224,958	81,560,201	2 10 4
'75....	32,749,167	7,326,288	53,086,691	25,880,806	86,293,785	2 12 8
'76....	33,093,439	7,260,119	51,812,438	29,851,647	88,924,204	2 13 9
'77....	33,446,930	6,012,564	63,536,322	30,144,013	99,692,899	2 19 7
'78....	33,799,386	7,453,309	59,064,875	32,636,877	99,155,061	2 18 8
'79....	34,155,126	7,075,386	61,261,437	32,835,911	101,172,734	2 19 3
'80....	34,468,552	10,239,295	62,857,269	38,744,593	111,841,157	3 4 11
'81....	34,929,679	8,525,256	60,856,768	35,760,286	105,142,310	3 - 2
'82....	35,289,950	9,271,956	63,539,315	31,992,680	104,803,951	2 19 5

* Exclusive of the army, navy, and merchant seamen abroad.

† Beef, meat salted or fresh, meat preserved otherwise than by salting, pork, bacon, and hams, butter, cheese, eggs, and potatoes.

II.—On the Method of ascertaining a Change in the Value of Gold.

By F. Y. EDGEWORTH, ESQ., M.A.

THE species of measurement which forms the subject of this note may have some light thrown upon it from the general principles of measurement known as the method of least squares. For, if our problem starts from the same sort of data, and seeks the same sort of *quæsitum*, as the problem of which the solution is found by the method of least squares, then it may be expected that the successful experience of physics will afford some indication as to the course to be pursued by the economic investigation. Now the data of the economic problem consist of a set of numbers each *primâ facie*, and in the absence of the others, equateable to the sought number: being each the ratio between the prices of an article at the two epochs under consideration; to which are in general to be added some indications as to the relative importance to be assigned to each datum. It is required to construct from these ratios a ratio expressing the appreciation or depreciation of gold: a *quæsitum* which may be defined as such that the total utility which a person* would derive from a certain income at the former of the two epochs under consideration, is equal to that which he would derive at the latter epoch from the same quantity of money multiplied by the sought number. Similarly the data in the simplest case of the method of least squares consist of a set of numbers each *primâ facie*, and in the absence of the others, equateable to the sought number: being each given by an observation of the magnitude under measurement; to which are in general to be added some indications as to the relative importance to be attached to each datum. It is required to combine these measurements so as to obtain the best measure of the magnitude: a *quæsitum* which is of the same order as the preceding,† that is, not a fact but a rule; not a physical thing to be tested by an appeal to the senses, but a maximum of advantage to be tested by that internal sense which compares quantities of utility. To say that the method is best which is oftenest right, is plausible; but this objective criterion ignores the consideration that in comparing methods we must take account not only of the frequency, but also of the *seriousness* of the errors incurred. The detriment occasioned by the employment in the arts and practical sciences of an imperfect measure, depending as it does in an unknown manner upon the seriousness taken in connection with the frequency of error, is as incapable of precise quantification, as the detriment occasioned to the consumer by a rise of price. In both cases objective measures are and must be employed; in both cases theoretically subject to—however seldom in practice interfered with by—the principle of utility.

* More precisely perhaps the equation should be between the utilities of a community, rather than of an individual. But probably as it is our definition will appear to affect an unreal precision; although it is implicit in what the best writers have written on the subject, *e.g.*, Professor Jevons (in *Money*) on the standard of value.

† As the present writer has argued, *Philosophical Magazine*, November, 1883, p. 361.

Having therefore some hope that the analogy of physics will throw some light upon our path, let us inquire what is the practice of the method of least squares as to the two points of procedure which seem chiefly to be controverted by economists, namely, what species of mean, whether arithmetic, or geometric,* or even harmonic, shall be adopted, and secondly, on what principle is relative importance to be attached to the data? The answer to the first question is that the arithmetical mean is always adopted, but not always for the same reason. It is adopted as the most advantageous not only in respect of convenience but also accuracy when the observations are of a certain type which tends very generally to be realised. The type is that which is described so fully by M. Quetelet: when the conditions of each observation are such that, if an indefinite number of observations under the same conditions were taken, the number of those which err by exactly

(plus or minus) x would be proportionate to $\frac{1}{\sqrt{\pi c}} e^{-\frac{x^2}{c^2}}$. If we

know that each observation conforms to this general type, and we also know what may be called the differential, the modulant c for each observation, then the (weighted) arithmetical mean is certainly the most probable and probably the most† advantageous method of reducing observations. That ideal type can seldom be perfectly realised; but there is reason to believe that the direction which it gives holds good approximately throughout a wide range of cases which approximately realise the ideal conditions. Thus if we know the first only‡ of the two conditions above stated, then the most probable value would seem to be not the arithmetic mean, but a certain mean approximate thereto. If for example the observations were x_1, x_2, x_3 ; then the most probable value would be

$$\frac{x_1 + x_2 + x_3}{3} \pm \sqrt{\frac{(x_1 - x_2)^2 + (x_2 - x_3)^2 + (x_3 - x_1)^2}{2}}$$

that is, approximately equal to the arithmetic mean; if the differences between the observations are small in comparison to their absolute magnitude. And again there is a wide range of cases in which the existence of the types, though not known, may be presumed, because there exist the conditions§ upon which the generation of the above written *law of error* depends. In the

* I use the term "geometric mean" in the sense employed by Professor Jevons and most mathematicians, according to which $\sqrt{x_1 x_2}$ is the geometric mean of x_1, x_2 ; not in the peculiar sense employed by Mayr as translated by Mr. Hooper (*Statistical Journal*, p. 293, September, 1883), for which the more usual designation would be "weighted arithmetic mean."

† The advantageousness of one *mean* as compared with another does not appear to admit of the same rigorous treatment as the comparison of one *system of weights* with another. See *Philosophical Magazine*, p. 362, November, 1883.

‡ If it was known that the errors of each observation (if repeated under the same circumstances) would range under a probability-curve, but unknown what the modulus was, or even that it was the same for all the observations.—*Ibid.*, p. 370.

§ See *Memoirs of Astronomical Society*, vol. xl, p. 105. Cf. *Philosophical Magazine*, October, 1883, article on *Law of Error*, postscript.

absence of this presumption the arithmetic mean still rests upon the sufficient, though inferior, ground of convenience. That is a sufficient ground in the absence of any other ground for preferring any other mean. That is the ground upon which the method of least squares as founded by Laplace in part rests. The first step in that celebrated investigation—the assumption that the *quæsitum* is an arithmetical mean—is (in the most general case) justified not upon the principle that this step is more conducive than any other to an accurate result, but solely upon the principle that it is the easiest step.*

By analogy the arithmetic mean is to be preferred in the economic investigation upon the ground of convenience in the absence of any other ground of preference. By a coincidence, rather than an analogy, there is very generally present here also as an additional ground of preference for the arithmetical mean a more or less perfect realisation of a certain ideal type. This type is the ideal case in which the same quantities of the same commodities are purchased at both of the epochs under consideration. For let $Q_1, Q_2, \&c.$, be the said quantities. And let their prices be $P_1, P_2, \&c.$, at the first epoch; $P'_1, P'_2, \&c.$, at the second epoch. Then it is evident that the amount of money $Q_1P_1 + Q_2P_2 + \&c.$, at the first epoch will go just as far as $Q_1P'_1 + Q_2P'_2 + \&c.$, at the second epoch. The required ratio is therefore the latter expression divided by the former; that

is, if we put $r_1 = \frac{P'_1}{P_1}, r_2 = \frac{P'_2}{P_2} \&c.$, $\frac{Q_1P_1 \times r_1 + Q_2P_2 \times r_2 + \&c.}{Q_1P_1 + Q_2P_2 + \&c.}$;

that is the weighted arithmetic mean of the ratios $r_1, r_2, \&c.$, where the weights are (proportional to) $Q_1P_1, Q_2P_2, \&c.$ This principle appears to be received by some of the highest authorities on our subject—accepted into the theory of Mr. Sidgwick† and the practice of Messrs. Ellis‡ and Giffen.§ The theory is well stated also by M. Laspeyres|| in his criticism of the Jevonian geometric mean; but his practice¶ is not quite conformable.

The ideal type is of course never perfectly realised; for—as Mr. Sidgwick points out**—even on the abstract supposition that the number and natures of the commodities do not change, yet if their mutual rates of exchange change, then the equilibrium of exchange being disturbed, the quantities exchanged will no longer be the same. Nevertheless, as a glance at the tables of Mr. Giffen or Mr. Ellis shows, there seems to be a fairly close correspondence between the ideal type and the real facts; probably closer than between actual observations and the ideal *law of error* in physics. Analogy is therefore decisive in favour of the arithmetic mean.

It follows that the geometric mean constructed by Professor Jevons has not much ground to stand upon. With the greatest respect for the authority of Professor Jevons, I venture to dissent

* Cf. *Memoirs of Astronomical Society*, vol. xl, p. 100.

† *Political Economy*, book i, chap. 2, sec. 3.

‡ *Statist*, 9th June, 1878.

§ *Journal of the Statistical Society*, 1879.

|| Hildebrand's *Jahrbuch*, vol. iii.

¶ He employs an arithmetic mean *not weighted*.

** Ibid.

from his reasons. They are stated in the *Journal of the Statistical Society* for 1865, p. 296—

“ In the present approximate results I adopt the geometric mean, because (1) it lies between the other two [the arithmetic and the harmonic]; (2) it presents facilities for the calculation and correction of results by the continual use of logarithms, without which the inquiry could hardly be undertaken; (3) it seems likely to give in the most accurate manner such general change in prices as is due to a change on the part of gold. For any change in gold will affect all prices in an equal ratio; and if other disturbing causes may be considered proportional to the ratio of change of price they produce in one or more commodities, then all the individual variations of prices will be correctly balanced off against each other in the geometric mean, and the true variation of the value of gold will be detected.”

The first line of argument would have to be carried much farther in order to reach a conclusion. We should have to take a mean of the countless myriads of forms which range under the general notion of a mean. But as this operation is beyond the resources of mathematics, so there is no presumption whatever that the result would be the geometric mean. In fine, *why* should the mean of means be the best mean? If it be urged that we should confine ourselves to those means which are convenient—the arithmetic, the geometric, and the harmonic—it may be replied that, if the appeal is made to convenience, the arithmetic mean* cannot fairly be put on a level with the geometric, much less with the harmonic. And besides if the harmonic mean be admitted, can we

fairly exclude such forms as $\left(\frac{r_1^2 + r_2^2 + \&c.}{n}\right)^{\frac{1}{2}}$ and $\left(\frac{r_1^{\frac{1}{2}} + r_2^{\frac{1}{2}} + \&c.}{n}\right)^2$?

Now the arithmetic mean might very well be regarded as the mean of such forms. And still there recurs the inevitable *Why*?

The second argument seems valid against other means, but not against the arithmetical. For the trouble of taking the arithmetical mean is less than the trouble of taking the geometric mean by the trouble of taking logarithms.

I am not sure that I quite understand the third argument; but without examining its exact import, it suffices to observe that it might equally be alleged of physical observations that, if their geometric mean be taken, the errors will be mutually compensatory.

It is fair to add that Professor Jevons does not put forward his principle in a spirit of confident dogmatism; that he seems almost content to rest the geometric mean on the consideration that it is *less* than the arithmetic. This is no doubt an important consideration. For it seems that an error of defect is here less serious than an error of excess—with reference to some purposes at least; such as the construction of a “Tabular Standard” where the proposed change if not a good is an evil. We ought then, as Aristotle would say, to steer clear of the more dangerous extreme. But query whether such a deflection from the arithmetic mean could not be secured at the expense of less trouble than is involved by the Jevonian logarithmic calculation.

As to the second question, upon what principle is relative

* See next paragraph.

importance to be assigned to the different data? that question has already been answered with respect to the typical case; and the answer found for that case may fairly be extended to neighbouring cases, agreeably* to the analogy. The typical system of weights may be adopted in its entirety with most propriety, perhaps, where the *quesitum* is something more limited and objective than we have proposed: as if it were sought to compare† the output of the manufacturer at different epochs. For more general purposes, such as that of the Jevonian tabular standard, a supplementary principle appears required. Such a principle is: to select those articles which are most important with respect to general well-being; a principle which appears to be generally and justly received. Aids to the employment of this principle are afforded by Mr. Giffen's recent address to the Statistical Society (November, 1883).

Another principle suggested by Professor Jevons,‡ that we should assign more weight to an article according as its price is less fluctuating—"as the range of the highest and lowest prices was less"—appears theoretically agreeable to the general principles of measurement, even though in practice§ its employment be found not to make much difference. That the data should be "independent," as Professor Jevons recommends, is also agreeable to analogy. For distant epochs perhaps special importance might be attached to the price of common labour, general wages; not upon the Smithian ground that labour is the "real price" of commodities, but partly upon the ground (indicated by Cairnes)|| that there is a certain interdependence between the price of labour and the price of subsistence, and partly on the ground that the price of labour seems to occupy a mean between the price of (most of) the articles which obey the *law of diminishing returns* and the price of those which have the opposite tendency. But it is not the scope of this note to enter upon considerations which require the close scrutiny of an eye adapted to practical details rather than the distant general view of abstract science. The directions which physical analogy gives as to the principle of weighting data are necessarily of a very general character. They seem to be, in addition to those which have been mentioned, principally two: not to despise indications of *weight* because they do not possess quantitative precision, and not to pursue the evaluation of weights to a degree of nicety which, being out of keeping with the roughness of other parts of the calculation, would be nugatory.

* It is true that this extension—this "prerogative of the type"—is in Laplace's method of least squares, justified by a peculiar reasoning which is not applicable to the economical problem. The employment of the method proposed in the *Philosophical Magazine* (November, 1883, p. 372) in cases where the facility-curves are not known to be of the typical species, would be a more exact analogue.

† *Statist.* 9th June, 1878.

‡ *Serious Fall in the Value of Gold*, p. 32.

§ *Ibid.*

|| *Leading Principles*, part 1, chap. v, p. 3.

III.—*Life Saving Processes applied to Railway Travelling.*

THE following statement is by Mr. F. T. Haggard, a Fellow of the Society, and it is believed, is the first of its kind:—

“The following extracts, taken from the Board of Trade returns on railway traffic, will tend to prove the advantages which have accrued to railway companies and the travelling public in consequence of the adoption of the various life-saving processes which have commended themselves to the notice of the engineers and locomotive superintendents in their several departments, and in favour of the use of which the Board of Trade has not been behind-hand in giving its advice from time to time.

“The application of block signals, continuous brakes, telegraphs and interlocking of points, may be costly, the results, however, show that the outlay is remunerative.

“For the sake of obtaining a fair average whereby to compare the advantages claimed, the results of the three years, 1868 to 1870, and those of 1880 to 1882, are furnished at foot.

“The passenger train miles run, and the compensation paid to passengers by fourteen of our larger railways are here thrown together.

“As to how much of the saving accomplished should be credited to this or that invention cannot easily be computed, and the beneficial results are probably due to the combined working of them all; greater care, improvement in construction of rolling stock, speed of trains, &c., &c., may all enter into the question.

“The greater the goods trains’ mileage of a railway where the double traffic exists, the greater the risk imposed upon the conducting of its passenger traffic, and a gradual separation of goods and mineral traffic from the mixed service by the introduction of separate rails for the purpose will be the last crowning point towards diminishing risks which now increase the demand for the application of the various life-saving processes in question.

“The figures I furnish are surely not those of chance; for, in the first period, the compensation per 100,000 train miles run is more than double that in each year of the latter period, and if the rate for compensation paid in the year 1868 be computed upon the mileage of 1882, in lieu of 223,000*l.* as then paid, it would have reached the sum of 497,000*l.*, or a further charge of 274,000*l.*

“A comparison of the two periods extracted shows that notwithstanding that over 121 millions more passenger train miles have been added, the compensation has been reduced by 206,000*l.*, or an average of nearly 70,000*l.* a-year.

“The computed saving of 274,000*l.* in 1882 represents the interest of a considerable amount of capital, and to this sum may be added the further saving to the companies through a diminished destruction of permanent way and rolling stock, and a lesser interference with the natural traffic. Only railway financial experts could compute this loss. I have no knowledge as to what proportion it bears to the compensation paid to passengers. As railway traffic

cannot be conducted except at 50 per cent. or more of expenditure of receipts for working charges, every 100,000*l.* lost or saved is the product of, and represents 200,000*l.* gross take."

Passenger Train Miles Run, and the Compensation Paid to Passengers by Fourteen of the Principal Railways in the United Kingdom for the Periods named.

	Passenger Train Miles.	Compensation Paid to Passengers.	Average Paid per 100,000 Train Miles.
	£	£	£
1868.....	60,704,080	272,942	449
'69.....	65,696,288	293,996	447
'70.....	70,012,660	295,543	421
	196,413,028	862,481	—
1880.....	102,164,015	212,746	208
'81.....	105,316,137	219,235	208
'82.....	110,665,599	223,021	202
	318,145,751	655,002	—

IV.—*Land Societies.*

THE Editor of the *Journal* has received the following letter:—

To the Editor of the Journal of the Statistical Society.

Sir,—I venture to hope the subjoined statement may be interesting to your readers, as supplementary to the paper I had the honour to read before the Society on 16th June, 1874 (*Journal*, 1874, pp. 327—36).

It shows the extent to which the societies registered for the purpose solely of buying and selling land under the Industrial and Provident Societies Act of 1871 (now embodied in that of 1876) have carried on their operations.

This is in addition to and distinct from the business of buying and selling land carried on by the ordinary co-operative societies, which have added that business to their usual distributive or productive purposes.

I am, Sir, your obedient servant,

E. W. BRABROOK,

Assistant Registrar of Friendly Societies for England.

23, Abingdon Street, Westminster.

13th December, 1883.

Co-operative Land Societies, 1882.

County.	Socie- ties.	Mem- bers.	Shares.	Debts.	Land.	Cash.	
Bristol	1	58	2,582	4,649	4,082	3,150	3 returns only
Derby	5	225	2,539	1,327	3,040	1,651	
Deron	1	33	507	814	1,290	31	
Dorset	1	34	1,500	5	1,102	402	
Hants	3	175	13,950	4,129	18,013	67	
Kent	1	77	685	864	1,431	118	{ Only 13 returns complete 3 returns only complete
Lancaster	7	1,462	52,279	55,609	80,680	25,825	
Leicester	15	813	13,119	14,047	24,910	2,106	
Lincoln	6	454	12,682	24,737	36,900	519	
Middlesex	1	502	11,312	1,650	12,409	553	
Northampton.	1	18	755	238	1,024	—	{ Only 13 returns complete 3 returns only complete
Nottingham...	2	487	5,170	733	4,788	1,113	
Oxford	1	492	16,076	—	15,857	218	
Stafford	1	30	367	49	415	—	
Surrey	2	123	1,465	1,120	2,512	68	
Sussex	1	44	4,592	2,807	4,909	2,490	
Warwick	1	74	2,634	55	2,680	7	
Worcester	1	69	725	5,585	6,251	59	
York	15	1,052	36,261	70,994	99,963	6,974	
	66	6,222	179,233	189,412	322,256	45,351	

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